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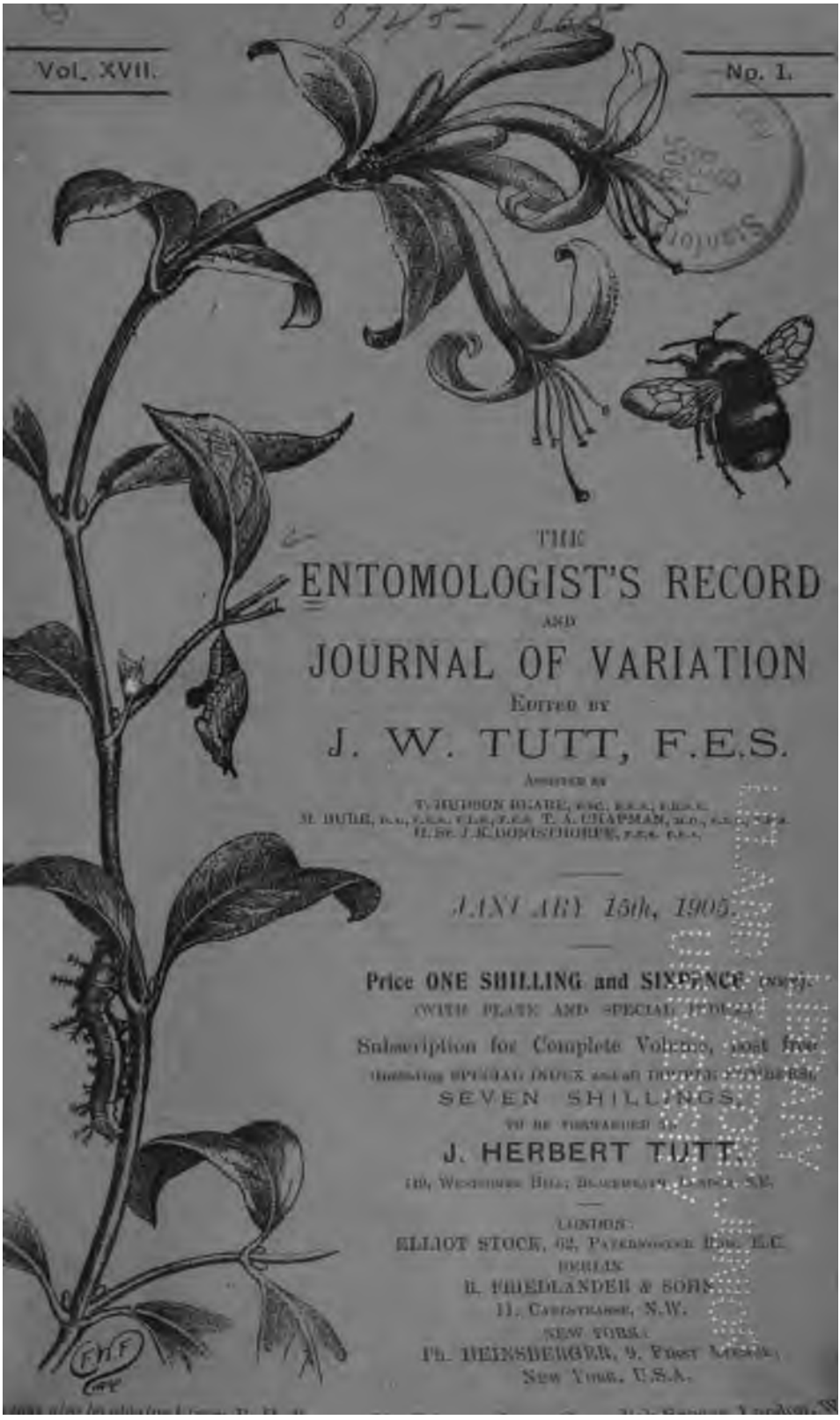

THE

ENTOMOLOGIST'S RECORD

AND

JOURNAL OF VARIATION

EDITED BY

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Mont Collon from the Kurhaus, Arolla.

The Arolla Valley from below the Bousette.

The Entomologist's Record
AND
JOURNAL OF VARIATION.

VOL. XVII. No. 1. JANUARY 15TH, 1905.

Lepidoptera of the Val d'Hérens—Arolla (*with photographs*).

By J. W. TUTT, F.E.S.

Arolla! To how many readers of this magazine does not the name conjure up one of the loveliest vignettes to be found throughout the length and breadth of the Alps? The long vista up the Arolla glacier, closed by the delightful snow-clad Mont Collon, the glorious snow-peak, the Pigno d'Arolla, and then the unpronounceable Zigiorenove glacier, with its huge moraine sweeping away from the foot of the Pas de Chèvres. To the left (looking towards the snow-peaks), the sharp Aiguille de la Za, a long and difficult ascent, and to the right again La Rousette and the Aiguilles Rouges, the slopes from the foot of which to the hotel make a marvellous collecting-ground, whilst now, right behind, at the foot of the Combe d'Arolla are the Dents de Veisivi, on the slopes of which, Mr. Lloyd informs me, *Œneis aëllo* flies in the greatest abundance. The knoll itself, on which the Kurhaus Hotel is situated, is a delightful flower-garden in the midst of the last and highest big remnant of the forest of Arolla pines, whose delicate fragrance adds such a charm to this delightful valley. And who can describe the flowers? Acres upon acres of yellow and orange hieracii, and billowy waves of the pale blue alpine forget-me-nots, with occasional masses of white and yellow alone breaking the continuous sheets of beauty they spread everywhere. A few hundred feet above the hotel, edelweiss is in the greatest abundance, and the comfort of the hotel itself marks Arolla, when reached, an ideal resting-place. I say, when reached, advisedly, for the journey to Arolla is not to be undertaken by cripples without considerable forethought, for the Kurhaus Hôtel is situated as nearly as possible at 7000 feet elevation, and there is no means of reaching it except by walking, or on mule-back. Arolla is exposed from early morning till late evening to the sun, a fact that, no doubt, goes far towards producing its wealth of vegetation and its abundant insect life. It is, indeed, a place of beauty, an ideal spot for a nature-lover, be he botanist or zoologist.

I have paid two visits to Arolla, the first consisted of four or five splendid days in the third week of August, 1899, whilst the second was a longer stay, from July 29th to August 11th, 1908. The first ended in a perfect holocaust. Following on four or five days' hard work, in which Dr. Chapman and I had amassed a splendid lot of specimens by day, and in setting which every spare moment had been utilised

in the early morning and late afternoon, an intelligent mule-driver, in spite of repeated warnings that my large collecting-box and setting-case were insecurely packed, managed to let the setting-case fall down a steep and rocky mule-path, smashing it entirely, and then, to mend matters, carefully put the boards loosely into the box with the set insects. Practically every specimen taken at Arolla was mangled into dust, and not until the man had disappeared, and we were anxious, at Evolène, to know how the specimens had travelled, did we learn the hopeless ruin that had befallen our labour. To attempt to describe the condition of my mind on that never-to-be-forgotten midnight ride down to Sion (for a hurried and peremptory return was necessary so far as the doctor was concerned) were futile. Thoughts of scraps of the wings of burnets, blues, whites, Erebias, Setinas, fritillaries, broken and bent pins, in huddled confusion under the heel of loose setting boards, created such demoniacal desires in my heart as I have rarely been possessed of, and till this present the mere mention of that night has been taboo with everyone cognisant of it; some 1200 perfect alpine lepidoptera, besides several long series of bred and captured insects that were on the boards when we journeyed up, these went down in one fell moment to endless ruin and perdition. That our other box, containing our captures of the preceding fortnight at Evolène and on the Simplon Pass, was left behind at Evolène, and that its contents had not shared in the general ruin was the only redeeming feature of that in some way unsatisfactory summer holiday of 1899. I may add here how remarkably different was the proportion of the various species observed in 1899 compared with 1903.

In 1899, several species, more or less rare in this late season of 1903, were in the greatest profusion. A magnificent form of *Argynnis niobe*, *A. aglaia*, *Erebia goante*, *E. euryale*, *E. gorge*, *Melampias epiphron*, *Colias phicomone*, *Anthrocera exulans*, *Setina aurita*, were in the utmost profusion. In 1903, without being actually rare, none of these species were common, whilst other species, hardly seen in 1899, were in great numbers, particularly *Erebia mnestra*, *Coenonympha satyrion*, *Nemeophila plantaginis*, *Mimaeseoptilus coprolactylus*, &c., the first named being particularly abundant, and occurring almost everywhere. It was remarkable that I picked up on this last visit several species that I did not see on the first, *e.g.*, *Œneis aello*, *Parnassius delius*, *Polyommatus phoretes*, *Colias palaeno*, &c. For actual number of specimens, however, there is no doubt 1903 was much inferior to 1899.

I suspect the best collecting-ground is the edge of the pinewood in which the Kurhaus Hotel is actually situated, a fine morning spent in idling right round the edge of the pines, from the Kurhaus down to the Hôtel du Mont Collon and back again, gives many things, in fact, all the species obtainable, except the really high alpine insects—*Erebia glacialis*, *E. gorge*, *Polyommatus phoretes*, and one or two others—whilst some are to be taken here that occur nowhere beyond, holding the warm sheltered sides of the wood as their last outposts up the valley, extending neither up the slopes towards the Aiguilles Rouges, nor along the bed of the valley towards the Arolla glacier, whilst, on the other hand, the small mountain stream that rushes down here brings many of the highest alpine plants to this level, and so encourages many species to extend downwards at this point, that are only to be found at a much higher elevation on the more exposed slopes around.

The whole of the somewhat flat ground, rather to the right than

opposite the Hôtel du Mont Collon, provides plenty of sport with *Parnassius delius*, which, however, is not very common, whilst among the pines themselves, specimens often wander, and it is remarkable that, with two successive strokes of the net, I captured here *P. delius* and one of the two examples of *P. apollo* that I saw. At the corner, near the hotel, too, *Anthocaris simplonia* occasionally flew up rapidly, and gave one a chance, as it kept to the edge of the trees, but all I netted were exceedingly worn. *Pieris callidice* was abundant on all the high knolls around, but, on one dull day, during a few short breaks of sunshine, I captured no fewer than four examples within 100 yards of the Kurhaus itself. It is most abundant, however, on the steep slopes to the left of the Arolla glacier, at a considerable elevation.

Colias phicomone was everywhere, some in magnificent condition, many, however, worn, but, on the whole, much smaller than the specimens captured at Larche, the only other place where I have ever seen it in absolute profusion on ground where it could be taken, yet, strange to say, in spite of their average small size, I took one female larger than any I have from any other locality. *C. hyale*, represented by two examples in 1899, and one in 1903, are quite pigmies, and the elevation is evidently too great for the species. *C. palaeno* loves most the slopes towards the Aiguilles Rouges, but is rather rare and often difficult to catch. I took one pair *in cop.*, and was much disappointed to find that the female, otherwise perfectly fresh and evidently newly-emerged, had the apex of the left forewing gnawed off, as it were, possibly, one supposed, by a lizard. Only one pale-tinted female occurred. The specimens captured, too, are much smaller than those I have from Davos, Guarda, Pontresina, Saeterstoen and Bossekop, and are nearest the size of those from Mont de la Saxe. *C. edusa* was not observed in the Combe d'Arolla at all. It is marvellous at what a height *Pieris rapae* occurs abundantly, well above 8000ft., and the specimens are of large size, though I only saw one example of *P. napi*, a worn ♂, with somewhat dark nervures, but not one of *P. brassicae*.

I have already stated that certain species appear not to extend their range beyond the corner of the wood at the Hôtel du Mont Collon. This was certainly my impression with regard to *Chrysophanus virgaureae*, the ♀s of which gave two forms, one very clear and brassy-looking, the other much suffused and with little coppery-brown in the colour at all. At the same place, *C.* var. *subalpina* was rare; I did not see more than half-a-dozen examples, and these not particularly good; a single ♀ *C. hippothoë*, *Polyommatus damon*, a single ♂ *Melitaea phoebe*, a solitary ♂ *Nomiades semiargus*: whilst *Polyommatus corydon*, *P. hylas*, and *P. astrarche* were much more abundant here than elsewhere, although, extending some way up the slopes towards the Aiguilles Rouges, where *Cupido minima* also was not uncommon, a few fresh, but mostly worn. *Pamphila comma* and *Syrichthus alveus*, abundant here, seemed to go up all the slopes for at least another 1000ft.; whilst *Polyommatus orbitulus*, somewhat smaller in size than the large Simplon examples, appeared to reach almost as high as the highest ground on which I found myself, at any rate, up to the level of *Erebia lappona*, *E. gorge*, and *E. glacialis*. On the flat ground, which *P. delius* haunts, countless thousands of *Plebeius argus* (*argyrognomon*) were to be found, and they were almost equally abundant on the slopes, in suitable spots, but *Polyommatus optilete* was very much restricted to the neighbourhood of

its foodplant, only a few examples, but these in good condition, being captured, at a few hundred feet above the upper hotel. Half-a-dozen specimens of *Brenthis euphrosyne* were taken, and a single example, strangely enough, higher up on the exposed slopes, but all were the worse for wear. *Vanessa io* was common here, too, *Aglais urticae* also; whilst the nests of the larvæ of the latter, were in profusion wherever nettles grew, and often well above 8000 ft. elevation, whilst *Erebia goante* and *E. euryale*, fairly common in and about the pinewood, were rarely seen elsewhere. Here, too, I captured four or five specimens of a small race of *Melitaea dictynna*, in exquisite condition, as well as *Issoria lathonia*, which also reaches a great elevation. *Melampias epiphron*, rare on the outskirts of the pines, was abundant in one or two places, high up, but *Erebia tyndarus* and *Melampias melampus* appeared to care neither for time nor place, being found everywhere.

I have already said that *Erebia mnestra* was one of the abundant species of 1903 in this district. I must have overhauled several scores of specimens, and set a good many very fine examples. Although found on the open ground, the males invariably made for the numerous scattered bushes of juniper on the slopes, hovering over, settling on, leaving and returning to, them, again and again. I could not make out what the habit meant, unless, indeed, the females of this species lay their eggs among the grass at the roots of these bushes, where certainly the larvæ would find most shelter during the winter in such an exposed habitat, and that the ♀s consequently were being sought there by the ♂s; such ♀s as we got, however, were out on the exposed slopes, and, at any rate, I was pleased to take a good series. There appear to be two forms: (1) without apical spots on forewings, very common in ♂ and rare in ♀; (2) with apical spots on forewings, common in ♀s and rare in ♂s. The former I call ab. *obsoleta*. Next in abundance, perhaps, was *Brenthis pales*, which is here a most interesting insect, and, apparently, subjected amazingly to local conditions that produce marked variations. Out on the more exposed slopes, one found only ♀s of brown hue, *i.e.*, following the coloration of the ♂s, whilst the undersides of both sexes were here particularly richly marked with red, but as soon as one found a damp spot, comparatively level, where the ground was boggy, the luxuriant vegetation growing up to one's waist and movement difficult, there, at once, the ♂s were larger, the ♀s rarely brown, and some, not only tinged with purple, but so covered therewith that they looked black on the wing, whilst the undersides of both sexes were pale, almost uniformly unicolorous yellowish (♂s), greenish tinted (♀s), and comparatively weakly marked with red. In one of these patches I caught a magnificent ♀ aberration, brown in colour, the typical markings of the centre of all the wings obsolete, except the discoidal cell of the forewings, whilst the terminal lunules on fore- and hindwings are converted into a series of black streaks, appearing as extensions of the black markings of the fringe, and uniting with a row of lunules, modified from the oblique subterminal row of dots, the marginal black line being entirely absent; the underside is also much changed, the neuration being marked in brown stripes and the paler markings more or less confined to the spaces between. This obsoletely marked aberration I would name ab. *obsoleta*, n. ab. Almost equally interesting is *Argynnis niobe*, of which the silvery-spotted form is not uncommon, but the most beautiful aberration of

this species is one in which the ordinary pale reddish areas of the underside, on which the yellow or silvery spots are placed, become a deep rouge or red-brown, &c., thus presenting a striking and beautiful contrast. This deepening of the ground colour of the underside of the hindwings occurs both in the yellow- and silvery-spotted forms, and I would call the form *rufescens* n. ab.—*rufescens-typica* (with silvery spots), *rufescens-eris* (with yellow spots). The ♀ s, on the whole, are here, also, very dark on the upperside. Similar forms occur at Lavancher, near the foot of the Mer de Glace, but I think those at Arolla are somewhat larger.

For two or three species we had to climb a good way up the mountain. I saw no *Melitaea cynthia* till I was a good 500ft.-1000ft. above the châlets, on the way to the Pas de Chèvres, and then only a few of either sex, nor did one meet with *Erebia gorge*, *E. glacialis*, or *E. lappona* until one got on the skrees of the Rousette, or on those below the rocks on which the conspicuous crosses are placed. It is a remarkable feature of the Erebias here that they tend to forms with little or no spotting—such is the case more particularly with *Erebia tyndarus*, and *E. gorge*, of which I got long and interesting series, and also, I think, of *E. lappona*, which, however, was scarce and going over. Here, too, on the herbage growing at the foot of the skrees, I captured several *Melitaea aurinia* var. *merope*, so poorly coloured, however, that I thought them worn, and rejected many, although those I now have I find to be in much better condition than any I have obtained elsewhere. Here, too, I found an occasional *Œneis aëllo*, swift of wing, and reminding one of *Satyrus semele*, whilst a single example of *aëllo* was taken down almost as low as the Hôtel du Mont Collon, on the bank of the stream that runs down by the side of the wood. Here, too, I may mention that, on August 6th, a large number of big, faded *Pyrameis cardui* invaded the district, so far as my captures were concerned ♀ s, that settled down, each on its own piece of ground, to the alternate duties of fighting with a neighbour and egg-laying. They were still busy when I left. *Epinephele lycaon*, so abundant further down the valley, does not seem to reach Arolla, nor did I notice *Coenonympha pamphilus*, but *C. satyrion*, worn badly, in the neighbourhood of the hotel, was in first-class condition here and there about 500ft.-1000ft. higher, the ♂ s of a very uniform sooty grey-brown hue, the ♀ s with the median area of the forewing brownish, and showing a distinctly darker margin, as in ♀ s of *C.* var. *darwiniana*, a form that, perhaps, has led to the statement that the latter is common throughout the Alps. True *C.* var. *darwiniana* has to me proved exceedingly rare, or, perhaps, it would be better to say exceedingly local. Perhaps I am rather too late. I have examples from Fusio, Macugnaga, Simplon, The Cristallo (Cortina), Campiglio, Mendel Pass (where the variety runs into typical *C. arcania*), the Penegal (above Mendel), Andermatt, and the Val Lauzon (near Cogne). The Tyrolean localities are excellent ones in which to note the transition from typical *C. arcania* to var. *darwiniana*; that *C. satyrion* is specifically distinct from these I feel quite convinced. It would be a good thing if we could get the eggs and larvæ (in all their early stadia) of these compared critically by an expert. The ♀ s, of course, from which the eggs were obtained should be

saved for reference. I ought, perhaps, to state that I found *Polyommatus pheretes* only on the slopes above the glacier d'Arolla, on the left hand side of the glacier walking towards Mont Collon, whilst a half-dozen examples of *P. eumedon* were taken here and there scattered over the slopes towards the Aiguilles Rouges. I have noted here all the butterflies of which I brought away examples, I believe also all that I observed.

Notes on Laphygma exigua with descriptions of larva and pupa.

By Paymaster-in-Chief GERVASE F. MATHEW, R.N., F.L.S., F.E.S.

On September 22nd, 1903, a fine breezy morning, with a fresh wind from the south-east, I captured a male *Laphygma exigua*, which I disturbed from among some masses of *Aster tripolium* in a salt-marsh, where I was looking for larvæ of *Cucullia asteris*. There had been a strong wind from the east-south-east and south-east for three days previous to this date, and the marsh was swarming with *Pyrameis cardui*, *Plusia gamma*, and *Stenopteryx hybridalis*, whereas, a day or two before this wind set in, when I was in the same locality, none of these insects were noticed. I think this pretty positive proof that they were blown across from the continent, especially as many of the *P. cardui* were much worn. Probably *L. exigua* was also blown over. The same evening—while sugaring on the coast several miles from this salt-marsh—I took a female *L. exigua*. The male was killed and set, but the female I kept for eggs. On the 24th of the same month, I took two more at sugar, but was not quite certain of their sex, although I felt pretty sure one of them was a female. These three were placed together in a large stone jar, with various stems and leaves of low plants, some tow and pieces of paper, together with a bit of sponge saturated with syrup, for the moths to feed on, and the jar was then covered with muslin. The first eggs were noticed on the morning of October 2nd, a batch having been deposited on the muslin cover, and I was at once struck with their peculiar appearance, for they looked as if they were clothed with a downy fluff, which seemed to be fixed in an upright position upon them in little tufts. From this date small batches of eggs continued to be deposited nearly every night up to October 14th, at which date the last moth died. Most of the down on the eggs attached to the muslin cover was rubbed off by the fluttering moths, but on some of the batches deposited on pieces of paper it remained until the larvæ hatched. Mr. Bacot, to whom I sent some of the ova, tells me that he considers they are covered with silk, spun by the parent moth, and not with scales derived from her body, and I should not like to differ from this opinion; but the batches reminded me, in a small way, of those of *Porthetria dispar*. For a description of the eggs by Mr. A. W. Bacot, *vide Ent. Record*, xvi., p. 55.

The first lot of eggs began to hatch on October 12th, and the little larvæ commenced at once to devour their egg-shells, and also the scales with which they were covered, and they occupied themselves in this way from twelve to twenty-four hours, before they wandered off to seek for other food. Viewed through a pocket-lens they were of a dark leaden hue, with shining black heads and a few very minute bristles. They

were supplied with broad-leaved plantain (which they would not touch, although it is said to be their foodplant), *Poa annua*, dandelion, and groundsel, and these three latter they nibbled at, eating away little round patches in the cuticle, but, in a short time, they settled down to the groundsel only, though for the first two or three days after hatching they were restless, and wandered about a great deal, and, doubtless, many of them were then lost, for I found they could easily squeeze themselves through the fine muslin which covered the jam-pot in which they were kept, and so I had to substitute fine cambric. By October 25th, they had grown very little, and many of them were then living in society in webs spun on the undersides of the leaves. They were kept in a warm room on a table close to the window. I fancy if they had been out of doors at this stage of their existence they might have attempted to hybernate. It does not state in any work I have in what stage this species passes the winter.

About the middle of November, many of the larvæ began to die off, turning black and flaccid, and I thought this might be due to the food, so I introduced some dock-leaves among the groundsel, and, as they immediately took to the dock, and seemed to thrive better on it, I withdrew the groundsel. At this date, they were of an uniform pale green, with brown heads, and still kept together in little family parties, devouring the cuticle of the dock-leaves. Unfortunately, dock is difficult to keep fresh for more than a day or two, and so I had to supply them with fresh food about every third day, removing each larva with a camel's hair pencil. When touched, they curled themselves round into a half-circle, and those that dropped often hung suspended by silken threads. I tried them with several kinds of dock, and found that they showed a decided preference for *Rumex crispus*, the crinkled leaves of which afforded them a better shelter to spin their webs in than the smoother leaves of other varieties, and it also kept fresher for a longer period. I do not possess a greenhouse or hothouse, so the breeding-cages were kept on a shelf fixed to a wooden partition between a bath-room and drying-room where a hot-water cylinder stands. The temperature here varied from between 48° F. and 60°F.

The larvæ continued to feed and grow slowly throughout the winter, but still kept dying off, and, by January 17th, most of those left, about two dozen, appeared to be fullgrown, and one of them spun a cocoon composed of silk and particles of earth against the side of its breeding-cage. On January 28th, only eight larvæ remained, and by February 13th, this number had been reduced to one, which lived for a few days longer and then died. The only larva that spun up and changed to a pupa died in that state, so my attempt to breed the species during the winter months ended in failure, which was extremely disappointing after having sacrificed three perfect specimens. If I had been lucky enough to have taken the parents six weeks earlier I have little doubt that the results would have been very different.

The only instance that I know of this species having been bred in England is recorded in Newman's *British Moths*, p. 290, where it is stated that, on March 2nd, 1859, Dr. Wallace exhibited specimens at a meeting of the Entomological Society of London that were bred from eggs laid by a female taken in the Isle of Wight. The eggs were laid about July 18th, hatched in about three weeks, the larvæ were fullfed about

September 12th, and the moths emerged about October 20th. A short description of the larva is given. I will now proceed to give descriptions of the larva at two stages of its life:—

1. *Taken on December 12th when about half-grown.*—Head dark brown and shining, smaller than second segment; whole of the upper-surface olive-green, thickly irrorated with paler dots; spiracular stripe pale yellow; spiracles yellow and seated in a pinkish blotch; central surface paler; legs brownish-green.

2. *Description of fullgrown larvae taken January 4th.*—Length a little over an inch, plump and cylindrical; head rather shining and smaller than the second segment, dark olive-brown, reticulated with darker spots, with a pale v-shaped mark above, and a small whitish blotch on each side of the mouth; the larvæ vary in colour on the upper surface from olive-green, some being almost black, and in others the olive-green is tinted with red; the whole of the upper surface delicately reticulated with minute golden-brown atoms, more conspicuous in some than in others; a very narrow pale dorsal line, almost obsolete in some cases; on each side of the dorsal line on each segment, a minute white dot; spiracular stripe distinct, pale yellow above tinged with pink along its lower edge; spiracles pale yellow with a pinkish blotch below them; in some varieties there is a rather broad darker stripe above, including the spiracles; under surface greenish-pink, irrorated with paler dots; legs greenish-brown; claspers paler. The larva has a very soft velvety appearance.

I am indebted to the kindness of Mr. A. Bacot for the following notes and descriptions of the young larva and pupa:—

Larva. First instar: When first hatched they were inclined to feed in small batches of four or five, but some six or seven days later they were all feeding separately, eating out the cuticle (either upper or under, indifferently) of the dock-leaf. *Shape:* Cylindrical, short and stout, with plump or swollen segments, anus rounded. *Head:* Small and rounded, very highly polished surface, black with black hairs. *Body:* The meso- and metathorax and first four abdominal segments show a subsegmental division dividing the segment into two subsegments, but the remaining segments are full and plump, showing no signs of subdivision. The skin is smooth and shining, of a very pale green, with a coat of minute spicules. The prothoracic plate or scutellum is large and all but black, and one would call it highly polished were it not for the fact that it is put somewhat in the shade by contrast with the excessively polished head. A small and similarly coloured anal plate is present. True legs dark. There is little or no difference in the development of the prolegs, perhaps the first pair are very slightly smaller than the following ones, but there is practically *no loop* in crawling, only an undulation. The hairs (setæ) are rather short and stiff, dark-coloured, and slightly clubbed or thickened at the tip, the tubercles at their bases—are dark brown and chitinous in character. The dorsal tubercles on meso- and metathorax are i small inner, ii large outer, in transverse line, and on abdominal segments they are of about equal size (ii of thoracic), and set as at the corners of a trapezoid. Of the lateral tubercles on meso- and metathorax, iii is in transverse line *below ii, iv below* iii, v anterior and below iv; the subprimary below,

and posterior to iv, is present, and well-developed in this skin, as is the case with some Noctuid larvæ, and vi, the other subprimary, as a minute hair, is in evidence beneath v. Owing to damage done to the larva in mounting, I can only make out the base of vii, and its exact location cannot be determined, as the leg has been torn off. On the abdominal segments, iii is situated close above the spiracle, iv close beneath, and v still further below on the raised area that forms the lateral flange; vi below v is well-developed, and a marginal group (vii) consisting of either one or two hairs. [Tubercle vii has two hairs on the 1st and 2nd abdominal segments of adult larva.] The spiracles are distinct with slightly raised black rims. The small tubercular point, slightly above and anterior to spiracle, is very distinct for so small a larva, as also is the marginal one in front of ii.

NOTE.—The tubercles of the adult larva are the same as in the larva in its first skin, and their positions are practically unaltered. [I sent some of the dead fullgrown larvæ to Mr. Bacot in spirit.—G. F. M.]

Pupa.—Described from a dead and somewhat shrivelled specimen. Length 10·50mm. It is very much shrunken dorso-ventrally; the greatest thickness is at the metathorax (3·50mm.), where the strong dorsal plates have withstood the forces that have elsewhere caused it to collapse. In shape it was probably tolerably cylindrical, short and full, being relatively long to end of wing-cases at 4th abdominal segment. The abdomen beyond this has suffered greatly from shrinkage, and it is not possible to say with any chance of accuracy what its shape may have been. The head is blunt and rounded; head, eyes, &c., being rather prominent ventrally. Colour bright brown, and surface as a whole smooth and shining. Anus smooth and somewhat blunt, its armature, which possibly may have received some damage, consists of two low conical processes with blunt points, these are situated a short distance apart, and point slightly away from each other. In addition to these, and situated near one of them, is a single slender spine, without hook, taller than the conical process. Probably it had a fellow near the other process, but if so it was broken off. The spiracles are large and distinct, oval, with raised rims. The upper portions of the 4th, 5th, 6th, and 7th abdominal segments are coarsely and deeply pitted, the pits being very deep and rather closely set; on the anterior abdominal segments this pitting is only faintly marked. There are no traces of setæ on the abdominal segments under 1″ objective, but there are two or three short and fine hairs on head-piece. Ventral head-pieces are prominent and glazed, eyes large. There are two small centrally situated covers beneath labrum and between the maxillæ representing the labial palpi. The maxillæ are very broad at base, and extend to very near the end of the wing-cases. The antenna-cases are raised, but narrow, and extend about the same distance. The covers of the first pair of legs do not extend more than half way. The second leg-covers to end of wings, and tips of third legs just protruding beyond them. The wing-cases are somewhat darker than the ventral shield and the other parts of the pupa, excepting the anterior margins of the lower abdominal segments.

Synopsis of the Orthoptera of Western Europe.

By MALCOLM BURR, B.A., F.L.S., F.Z.S., F.E.S.

(*Continued from* vol. xvi., p. 323).

Genus VI: Chrysochraon, Fischer.

Characterised by the pointed head, absence of foveolæ, very slanting frons, shining colour, and long pointed horizontal subgenital plate of the ♂; the elytra are short in the ♂, lobiform in the ♀, and the wings abortive in both sexes, but examples with fully developed organs of flight occur occasionally.

Table of Species.

1. Larger; pronotum rough; hinder knees dark; elytra of ♀ lobiform, greyish, pointed; upper valves of ovipositor short, inflated at base, curved	1. dispar, Heyer.
1.1. Smaller; pronotum smooth; hinder knees same colour as femora; elytra ♀ lobiform, rosy, rounded; valves of ovipositor long, straight, compressed	2. brachypterus, Ocsk.

1. Chrysochraon dispar, Heyer.

Grey, shining. Length of body, 18mm. ♂, 25mm. ♀; of pronotum, 3mm. ♂, 5mm. ♀; of elytra, 10mm.-15mm. ♂, 7mm.-9mm. ♀; of wings, 8·5mm.-14mm. ♂, 3mm.-16mm. ♀.

The ♀ is easy to distinguish from the following species, but the ♂s of the two kinds resemble each other more closely. *C. dispar* may be recognised by the rough pronotum and dark posterior knees. It occurs in wood-clearings in central Europe. In France, it appears to be commonest in the Paris basin, in the forests of Sénart, Bondy, and Saint Germain; also at Langrange, Fontainebleau, Episy, Malesherbes, Mont Doré, Soissons, Marne, Nantes, Senlis, and Tarbes. In Germany, it is common in Thuringia and the Hartz Mountains; also at Stettin. In Switzerland, it occurs, apparently, only round the Lake of Geneva. It is found throughout Austria, near Vienna, common at Bisamberg, near Weidlingen, Mauer, Baden, Neusiedlersee. It is unknown in the Iberian Peninsula. The fully-winged form is exceedingly rare. Brunner records it from elevated dry places in the Wienerwald.

2. Chrysochraon brachypterus, Ocskay.

Distinguished from the preceeding chiefly by the smooth pronotum. Length of body, 13·5mm.-15mm. ♂, 18mm.-22mm. ♀; of pronotum, 2mm.-3mm. ♂, 3·6mm.-4mm. ♀; of elytra, 5·5mm.-14mm. ♂, 3mm.-16mm. ♀; of wings, 1·3mm.-13mm. ♂, 1·8mm.-16mm. ♀.

This is a mountain insect found in similar localities to the last, but generally a little commoner. In France it is rarer, recorded from Cauterets, the Jura, and Mont Doré. It does not occur in the north of Germany. In the Tirol it has been found at Igls, near Innsbruck. In Spain, it is represented by the variety *intermedia*, Bol., distinguished by the pointed elytra of the ♀, discovered at Collsacabra at about 3300 ft.

Genus VII: Stenobothrus, Fischer.

We now come to the most difficult genera. *Stenobothrus, sensu stricto*, as defined by Bolivar, corresponds to Brunner's first subdivision of the *genus in* the wider sense. Bolivar has divided the old large genus

Stenobothrus into four subgenera, which are here treated as distinct genera, for better convenience in dealing with the numerous species. *Stenobothrus* in the strict sense is characterised by the long, narrow mediastinal area and by the strong tooth on the valves of the ovipositor.

TABLE OF SPECIES.

1.1. Elytra strongly abbreviated (size small, ulnar vein undivided; Austrian species) .. .. .. 1. CRASSIPES, Ocsk.

1.1. Elytra generally developed. (Larger insects.)

2. Carinæ of pronotum slightly diverging anteriorly and posteriorly, slightly bent in in front of the typical sulcus; ulnar area absent, owing to fusion of the two ulnar veins, or extremely narrow; very rarely it is distinctly developed, but, in this case, the discoidal area is very much broader, with regular parallel fenestrations

3. Ulnar veins fused or united near the base, so that ulnar area is absent.

4. Elytra and wings longer than abdomen; elytra with a white band a little beyond the middle; second radial vein sinuous, and the ulnar veins fused from the base .. .. 2. LINEATUS, Panzer.

4.4. Elytra and wings shorter than abdomen; elytra with greyish spots along discoidal area, and a white spot near apex, but no white stripe; second radial vein straight, and ulnar veins visible separately as far as middle of elytra, where they are fused, but they are contiguous always .. .. 3. NIGROMACULATUS, H.-S.

3.3. Ulnar veins separate throughout their length, though sometimes almost contiguous, and even fused in a few isolated spots.

4. Ulnar area straight, the two veins almost contiguous; elytra as long as abdomen in ♀, and slightly longer in ♂, with second radial vein sinuous, the discoidal area more or less dark with a large white spot in the middle of a grey space situated at one third the length of elytra .. .. .. 4. FISCHERI, Eversm. = (*nigrogeniculatus*, Br.)

4.4. Ulnar area slighty broadened towards apex, the ulnar veins diverging from the base; elytra generally shorter than abdomen in ♀, and slightly longer than ♂; second radial vein straight, the discoidal area crossed by a black band interrupted by white spots, with a small white spot near the apex of elytra.. .. .. 5. STIGMATICUS, Ramb.

2.2. Carinæ of pronotum distinctly bent in and even almost angled in the prozona, much more strongly diverging behind than anteriorly. Ulnar area gradually broadened from base.

3. Smaller; last segment of palpi of uniform colour; antennæ short; carinæ of pronotum angled; elytra with radial area parallel, or only slightly broadened towards apex .. .. 6. FESTIVUS, Bol.

3.3. Larger. Last segment of palpi of different

colour from other segments; antennæ very long and slightly depressed at apex; carinæ of pronotum strongly arched; elytra with radial area broad, and broader still beyond middle.

4. Last segment of palpi (♂ ♀) blackish at apex; radial area of elytra broad beyond middle; elytra and wings almost reach apex of abdomen .. 7. GRAMMICUS, Caz.

4.4. Last segment of palpi ♂ round and coral, of ♀ cylindro-conical and reddish; radial area broad in middle; elytra and wings beyond abdomen .. .. 8. BOLIVARI, Br.

1. STENOBOTHRUS CRASSIPES, Ocskay.

This is easily recognised by its smaller size and abbreviated organs of flight, together with the broad and regularly reticulated discoidal area of elytra. Length of body, 12·5mm. ♂, 16mm. ♀; of pronotum, 2·6mm. ♂, 3mm. ♀; of elytra, 4mm. ♂, 8mm. ♀.

This is a very local Austrian species; it is common on dry hills near Vienna, at Ottakring, Speising, Mauer, Sauerbrunn.

2. STENOBOTHRUS LINEATUS, Panzer.

One of the largest species of the genus; the ♂ has the abdomen bright red above; characteristic is the deep green of the pronotum, with reddish keels, the white stripe of the elytra, often tinted with yellow, and the white spot near the apex; by variety, the white is sometimes replaced by deep violet. Length of body, 18mm. ♂, 23mm.-27mm. ♀; of pronotum, 3·2mm. ♂, 5mm. ♀; of elytra, 13·5mm. ♂, 14mm.-18mm. ♀.

It is common in central Europe; in England it is local, occurring at the Folkestone Warren, Boxhill, and a few other localities in the southern counties. In France it is common, though less so in the south. In Spain, it occurs in the mountains throughout the country, and has been recorded from the Sierra Nevada, the Cordillera Carpetana, the Pyrenees, and near Burgos. It is found also in Sweden; in Belgium, at Arlon, Fagnes, Francorchamp, Halboy, Han-sur-Lesse, Campine, Pietersheim, and Dieppenbreck; also in Switzerland, in the highest mountains.

3. STENOBOTHRUS NIGROMACULATUS, Herrich-Schäffer.

Resembles the last, but differs in the narrower, more pointed elytra, with no white spots, and less regular fenestrations of the discoidal area. Length of body, 15mm.-18mm. ♂, 19mm.-24mm. ♀; of pronotum, 3mm.-4mm. ♂, 4mm. ♀; of elytra, 10mm.-13mm. ♂, 10mm.-16mm. ♀.

Rarer in western Europe. In France, only quoted from Lardy, Barèges, and Canigou. In Spain, it is found in the Pyrenees and Catalonia; Madrid, Valencia, Tona, Berga, Bujaruelo, and in Portugal, at 5900 ft., in the Serra de Estrella. It is common near Vienna, Bisamberg, Petersdorf, Kaltenleutgeben, Mauer, Mödling, Baden, Gutenstein, Felixdorf, and Oberweiden.

4. STENOBOTHRUS FISCHERI, Eversmann (=*nigrogeniculatus*, Brunner).

Closely resembles S. lineatus, but differs in the much narrower

elytra, the division of the ulnar veins, the entirely black knees, and deep red hind tibiæ. The ulnar veins in the ♂ are almost continuous, and sometimes confused at a few points, so, if attention be paid to this point only, it can be mistaken for the preceding species; it resembles *S. lineatus* in the curved, second radial vein. It is also very close to *S. stigmaticus*, which see. Length of body, 18mm.-21mm. ♂, 23mm.-26mm. ♀; of pronotum, 3mm.-4mm. ♂, 4mm.-5mm. ♀; of elytra, 12mm.-15mm. ♂, 14mm.-16mm. ♀.

This is a species with an easterly distribution. It occurs, in July, at Oberweiden, in Moravia, not very far from Vienna. It has been found in Spain, at Logroño.

The variety *glaucescens*, Bol., with the thicker head, ulnar veins of elytra very near to each other, has the colour green, with many of the veins white. This variety has been recorded from Madrid, Soria, and on the banks of the Jucar in the Serrania de Cuenca, and, in June, at Ribas, in Catalonia.

5. Stenobothrus stigmaticus, Rambur.

This is like *S. nigromaculatus*, but smaller; it differs in the division of the ulnar vein and the irregular reticulation of the discoidal area; it is also exceedingly closely allied to *S. fischeri*, but differs in the normal development of the ulnar area. Length of body, 11mm.-15mm. ♂, 18mm.-20mm. ♀; of pronotum, 2mm.-6mm. ♂, 3mm. ♀; of elytra, 9mm. ♂, 10mm.-12mm. ♀.

Locally distributed in western Europe, chiefly in the mountains. In France, it is commonest in the north and centre, as at Paris, the Vosges, Fontainebleau, Hyères, Cauterets, Mont Doré, Malesherbes, Barèges, Lorraine, Wimereux, Chantilly, and the Indre. It occurs throughout the Spanish peninsula; also in South Germany, at Regensburg, and in Thuringia. In Belgium, it is recorded from Halloy, Arlon, Vieilsalm, Spa, Chaudfontaine, Pietersheim, Groenendaal. It is less common in Italy, but has been taken at Voltaggio. In Austria, it occurs near Vienna, Eichkogl, Mauer, Baden, Felixdorf, Oberweiden, Kranichberg, and the Neusiedlersee.

6. Stenobothrus festivus, Bolivar.

Even more variable in colour than the last; its characters are set forth in the table. Length of body, 16mm. ♂, 19mm. ♀; of pronotum, 3mm. ♂, 3·5mm. ♀; of elytra, 12mm. ♂ and ♀.

Fairly common in fields, at a moderately high elevation, in nearly all the Spanish Peninsula—Uña, Majadas, Villalba, Grenada, Uclès, Jaca, Aranjuez, San Ildefonso, Escorial, Gredos, Navacerrada, Oña, Montserrat, Sitio, &c.

7. Stenobothrus grammicus, Cazurro.

A handsome species, notable for the length of the antennæ, which are slightly depressed at the apex in the ♂; the abdomen is red above at the apex, and, in the ♂, the palpi have the last segment black, and very slender. Length of body, 17mm. ♂, 23mm. ♀; of pronotum, 3·5mm. ♂, 5mm. ♀; of elytra, 13mm. ♂, 16mm. ♀.

Inhabits the hilly regions of the centre and north of Spain. Ciudad Encantada, Uña, Majadas, Oña, Peñalara.

8. Stenobothrus bolivari, Brunner.

Distinct from its allies in the form and colour of the last segment

of the maxillary palpi, which in the ♂ are very short, globose, conical, and coral-red in colour; length of body, 17mm.-18mm. ♂, 23mm.-25mm. ♀; of pronotum, 3mm.-6mm. ♂, 5mm. ♀; of elytra, 14mm. ♂, 17mm.-19mm. ♀.

A purely Spanish species, occurring in the central region of the country; it is recorded from the Guadarrama, Albarracin, Sierra de Gredos, Madrid, Sitio, Cambron, Uña, Uclès, and the Peñalara. It is found in dry barren places from June to October.

Useful information as to the distinction between *S. grammicus* and *S. bolivari*, as well as about *S. festivus* and *S. stigmaticus*, are given by Pantel in his *Notes orthopterologiques*, vol. iv., in the *Anales de la Sociedad española de Historia Natural*, 1896, vol. xxv., pp. 125-128.

9. STENOBOTHRUS MINIATUS, Charpentier.

This species was accidentally omitted from synoptical table. It is easy to distinguish from its congeners by the ulnar veins nearly approximate at the base, but suddenly diverging from the middle; by the thickened and darkened veins in the anterior part of the wings, and by the regular, transverse fenestration of the wings between the radial and ulnar area, and the posterior tibiæ are crimson, the size is large and the general colour dark olive, rarely greenish; the elytra are ample, smoky, with a white spot near the apex in the ♂, paler in the ♀, with dark spots, and often a yellow band in the scapular area; the wings are smoky black, and alike in both sexes. Length of body, 21mm. ♂, 26mm. ♀; of pronotum, 4-2mm. ♂, 5mm. ♀; of elytra, 18mm. ♂; 16mm. ♀.

This species is very distinct, and has some resemblance to *Stauroderus morio*, but differs in the generic characters. It occurs in stony places at a high elevation in the Alps from Geneva as far east as Transsylvania; it is found as far north as southern Thuringia, and near Vienna; it appears not to be known in Spain, France, and Italy.

(*To be continued.*)

Descriptions of additional aberrations of Leucania favicolor.

By Paymaster-in-Chief GERVASE F. MATHEW, R.N., F.L.S., F.E.S.

On p. 252 of the last volume, Mr. Tutt describes certain aberrations of *Leucania favicolor* from a series I sent to him early in August, but since then I have taken others of a second brood, and among them there are three more interesting aberrations. These were also forwarded to Mr. Tutt, but not until it was too late for him to include them in his paper, so I have appended hereto a description of them.

In my note to Mr. Tutt I stated that the four specimens of the second brood, that I took on the night of August 27th, were a trifle smaller than those of the spring brood, but I have taken others since that date that are fully as large.

The ab. *fusco-rosea*, of which I have only two examples, were both bred in June, but were overlooked when I sent the series to Mr. Tutt.

1. Forewings deep orange, one dot only representing elbowed line; hindwings smoky, nervures distinctly darker, fringes pale = ab. *aenea*, n. ab. A very striking and beautiful aberration.

2. Forewings cinnamon-brown, with smoky clouding between some of the nervures; discal dot, and dots forming elbowed line, small and indistinct; hindwings smoky, nervures slightly darker, fringes pale = ab. *obscura*, n. ab.

3. Forewings very silky, pale creamy-buff, hind margins flushed with rosy

pink; discal dot, and dots representing elbowed line, very small and indistinct, hindwings whitish-grey with nervures slightly darker = ab. *pallida*, n. ab.

4. Forewings rosy-buff; discal dot, and row of dots representing elbowed line, small, but distinct; hindwings pale rosy, with nervures conspicuously shaded with dark brown = ab. *fusco-rosea*, n. ab. This is a delicate and beautiful aberration.

Notes on Gortyna ochracea (flavago).

By J. W. H. HARRISON, B.Sc.

I have been attracted to this species by the fact that there is something curious about it. It is generally assumed that it passes some five months in the larval condition. I am inclined to think that, here at least, it often passes at least seventeen months in that state. For some years, I have always been surprised to note that, when splitting the stems of the foodplant for pupæ, especially when the food was *Carduus palustris* or *Artemisia vulgaris*, small larvæ of *G. ochracea*, about 12mm. long, were present. I had generally concluded that these never reached maturity, being killed by the frosts of the winter. In the last week in March this year (1904), however, I was looking for larvæ of *Xylophasia rurea*, which delight to hide in thistle-stems during the day, when I came across a larva of *G. ochracea* inside a dead stem, and this larva, to judge by the frass, was feeding freely. I then searched further and found other larvæ in different stems. These larvæ all averaged about 1·5cm. long. Thus it would seem that the larvæ feed throughout the winter inside dead thistle-stems. There was no chance that these were cases of the early hatching of ova, followed by rapid feeding up, as this season was very backward here. The ova, when kept indoors even, do not hatch until March and April. Here the pupæ are to be got freely during the first and second weeks in September, inside the stems of the foodplant. Upon the coasts of Durham and Northumberland, the foodplants are *Carduus arvensis* and *Senecio jacobaea*. Inland, the foodplants are the common-thistle, the marsh-thistle, and mugwort, but especially the last. The pupæ are found head uppermost in a cell, consisting of the hollow stem with a pad of frass and silk at the bottom. Just above the head is a large round hole, perforated by the larva, to allow of the easy exit of the imago. At intervals up the stem are holes, out of which the larva, as it proceeds down, ejects its frass. The pupæ are largely preyed upon by earwigs, even when healthy, but still more destructive is a large species of ichneumon, which passes the winter as a fullgrown larva inside the pupa, for I found several on Christmas Day, 1902. The female pupa is easily recognised from its size, being much elongated, whereas the male is little more than half the size. Generally speaking, more female pupæ are obtained than male, probably owing to the fact that the female larvæ, eating more food than the male, weaken the stem to such an extent that it bends over in nearly all cases, thus betraying the existence of a pupa inside. Usually one pupa is found inside, but, in rare cases, two are sometimes obtained. Once I was fortunate enough to get three pupæ from one mugwort stem. The insect emerges in the third week in September. If one examines the stems between 8 a.m. and 10.30 a.m., the imagines are to be found expanding their wings and are by no means easy to see, as I have often, while grasping a stem, taken hold of an insect without seeing it. The female generally lives about 25 days—at least I have found this to be the case in

captivity. I got a female pupa this year on September 3rd. The imago emerged on September 24th. I placed it in a chip-box and it lived until October 18th. This insect pairs very readily in captivity. I have read somewhere that ova of this species are readily obtainable from the larval burrows. Undoubtedly ova are to be found in such places, but they are ova of earwigs*. I enclosed about half-a-dozen females over growing mugwort, and also over old stems formerly tenanted by larvæ, and found that the ova were deposited, in preference, in a place on the mugwort, where a twig had been broken off early in the year, and none at all upon the dead stems. I have several times sent pupæ to friends to "put down," but they have always failed. In September, 1903, I took three females and two males, and placed them upon a plant of *C. palustris* in a locality where I had never taken the species before. I saw nothing more of the insects, but, in September, this year, I found about eighteen pupæ in various plants of marsh-thistle, within a radius of a hundred yards of the plant where I had liberated the insects. The ova are of the shape of what are known (here at least) as Dutch cheeses, and are somewhat larger than the ova of *Polia chi*. When first laid they are bright yellow, but soon change to a dull pink, mottled with brown. The micropyle is situated on the upper surface of the egg in the centre of a depression. The eggs lack the usual sculpture of a Noctuid ovum, but, under the microscope, show signs of faint depressions. Just previous to the exit of the larva the egg turns grey. The eggs hatch in March and April. Larvæ of varying sizes are to be found throughout the summer, and, this year, upon July 16th, most were about three-quarters grown. Near Birtley here, we get two forms of the insect. Those in the Wear valley, like those on the coast, are of the northern form, while those found upon the old ballast-heaps from the blast furnaces, are exactly the same as southern forms. A further point worthy of notice is that, of necessity, the ova, at one station here, must pass at least three months under water without injury, for the Wear overflows the place for that period.

COLEOPTERA.

NOTES ON CUMBERLAND COLEOPTERA IN 1904.—I have not much of interest to record for the past season, my experience being that it was one of the worst for many years, notwithstanding the protracted spell of fine summer weather. Collecting at midsummer was especially bad, many species usually seen abundantly not being noticed at all, and such that did turn up being "over" in a very short time; but this I always find the case in hot seasons. From flood-refuse in April I took *Stenus picipennis*, Er., new to the county, but only a single specimen; also *Bembidium schuppeli*, Dej., *Homalota insecta*, Th., *Chilopora longitarsis*, Er., *Ancyrophorus omalinus*, Er., *Clambus armadillo*, Dej., and many commoner species. A fine *Amara acuminata*, Pk., always rare here, was picked up on a road. Beneath stones, in May, *Cychrus rostratus*, L., and *Pterostichus lepidus*, F., were noteworthy. A cold day on Wan Fell yielded a fair series of *Bradycellus collaris*, Pk., by working fairly dry moss sheltered by overhanging clumps of ling.

* There ought to be no doubt as to this. The eggs of a Noctuid moth ought to be pretty readily distinguishable from the eggs of earwigs. The statement referred to is to be found *antea*, vol. xv., p. 102.—ED.

Coryphium angusticolle, Steph., was found in dry fungi on a path, and by beating furze bloom *Philorinum sordidum*, Steph., and *Ceuthorhynchidius versicolor*, Bris., were obtained. Beating sallow, from which the catkins were beginning to fall, produced *Elleschus bipunctatus*, L., in abundance with several Epuræas, &c., of no particular interest, but bushes without catkins were quite unproductive. At Silloth, *Homalium laeviusculum*, Gyll., new to Cumberland, was found under shore refuse with *H. rugulipenne*, Rye, *H. riparium*, Th., several species of *Aleochara*, *Phytosus balticus*, Kr., *Philonthus proximus*, Kr., *Erirhinus bimaculatus*, F., &c., while *Saprinus maritimus*, Steph., was common under carrion, burrowing to some depth in the loose sand. On Cumrew Fell, *Deliphrum tectum*, Pk., occurred in numbers on the carcase of a sheep, *Arpedium brachypterum*, Gr., and *Hyperaspis reppensis*, Hbst., in moss, and *Acidota crenata*, F., and *Otiorhynchus maurus*, Gyll., under stones, as well as many species previously recorded from this prolific hunting-ground. Sweeping, at the end of May and in early June, produced *Encephalus complicans*, West., *Gymnetron labilis*, Hbst., *Rhynchites minutus*, Hbst., and *R. aeneovirens*, Marsh., while *R. cupreus*, L., was beaten from crab-flowers in quite a new locality. Crossfell, in June, gave little of interest but *Miscodera arctica*, Pk., *Agabus congener*, Pk., *Hydroporus morio*, Dj., and *Otiorhynchus maurus*, Gyll. In the Eden valley, the usual riparian Geodephaga were noticed, the fine blue form of *Bembidium punctulatum*, Drap., being captured several times. I do not know whether this form is familiar to many coleopterists, but it has not been recorded from Cumberland before. *Gymnusa variegata*, Kies., was taken in a muddy place, and *Microglossa pulla*, Gyll., in plenty, in a sandmartin's nest. Sweeping in June was unsatisfactory, but I got *Antherophagus pallens*, Ob., *Brachytarsus varius*, F., *Apion gyllenhali*, Kirb., *Balaninus villosus*, F., *B. pyrrhoceras*, Marsh., &c. In July, I took nothing worthy of record. August was better, and additions to the county list were made in *Philydrus coarctatus*, Gred,, *Stenus argus*, Gr., *Ocyusa maura*, Er., *Ceuthorhynchidius nigrinus*, Marsh., and *C. pyrrhorhynchus*, Marsh. On the banks of the Black Lyne, in October, I took some fine *Bembidium bruxellense*, Werm., and *Geodromicus nigrita*, Müll., and, in various localities, swept *Sitones suturalis*, Steph., in some numbers, a species not recorded before from Cumberland, but probably overlooked, as I find I have specimens taken in 1898.—F. H. Day, F.E.S., 27, Currock Terrace, Carlisle. *December 15th*, 1904.

A rare Quedius in Sussex.—I had the pleasure in April of this year (1904), to take the fourth recorded specimen of *Quedius nigrocoeruleus*, Rey. The specimen was captured about a foot down a large rabbit-burrow in a sand-pit, near the village of Ditchling, Sussex. The species is easily differentiated from its allies by the cold blue-black reflection of the elytra, and the difference in sculpture, &c. The three previous records are:—(1) At Tostock, Suffolk, captured by Mr. W. H. Tuck, in nest of *Bombus hortorum* (see *Ent. Mo. Mag.*, 1890, p. 50). (2) The second specimen was also captured by Mr. Tuck, in Suffolk (see *Ent. Mo. Mag.*, 1898, p. 267). (3) The third specimen was captured by Mr. Bedwell, at Kessingland, near a rabbit-warren (see *Ent. Mo. Mag.*, 1898, p. 268). It will be noticed that this species evidently has some affinity for rabbit-warrens, as both Mr. Bedwell's specimen and mine are from such places. I

wish to express my thanks to Mr. H. St. J. K. Donisthorpe for naming the specimen, and supplying me with its previous records of capture. Many other of my problems also owe their solution to Mr. Donisthorpe's kind help.—HEREWARD DOLLMAN, Hove House, Newton Grove, Bedford Park, W. *December 20th*, 1904.

RE-OCCURRENCE OF QUEDIUS KRAATZII IN 1904.—It is as well, perhaps, to record that *Quedius kraatzii* still occurs in its original habitat. I went down to Chiddingfold on June 8th this year, as I wanted some more specimens (for friends and for myself, as I had only three left of my former captures), and found the insect on the exact spot where I took it last. HORACE DONISTHORPE.

SYMBIOTES LATUS AT PALMER'S GREEN.—On September 29th last, I went to Enfield to join Mr. Pool for a few days' collecting in this district. At Palmer's Green, under the bark of a felled elm, we took eight specimens of the rare *Symbiotes latus*. The beetles were only found where a white powdery fungus occurred under the bark, looking much as if flour had been spilt on the tree.—IBID.

COLEOPTERA AT MARKET BOSWORTH.—In July, I went to Market Bosworth to pay a visit to my friend, Mr. Bouskell, and to try and take *Tetropium castaneum*, the new British longicorne, discovered by him last year. The object of the trip was successfully carried out, the *Tetropium* being taken as soon as the tree, a tall spruce, was reached. Several specimens were secured (my share being a nice ♂ and ♀), and larvæ, pupæ, and an ichneumon (which Mr. Morley informs me is new to science) parasitic on the beetle were also found. A very high ladder was used to reach the higher parts of the tree, and it is by no means a pleasant job standing on the top rungs whilst both hands are being used to chip at the bark of the tree! The next best capture was over a dozen specimens of *Abdera 4-fasciata*, taken from a stack of oak-logs. This rare beetle is a new record for Leicestershire. *Dorcatoma chrysomelina* was found in great profusion in a rotten oak-tree on the ground, *Eraesthetus scaber* was taken under moss by the side of the canal when we were bathing; and some days after I had left Mr. Bouskell took *Pediacus dermestoides* under bark. These two last species are both new to the county list.—IBID.

On some doubtful or very rare British Coleoptera.

By E. A. NEWBERY.

(*Concluded from* vol. xvi., p. 205.)

In my paper with the above heading in the July number of this magazine, I promised to say a few words on some changes in synonymy which appear to be desirable, and also to remark on some rare species which could not properly be included in the three classes referred to in that paper, but which for various reasons appear worthy of notice.

The following are the alterations in synonymy, &c. proposed:—

Anchomenus puellus, Dj., must sink as a var. of *thoreyi*, Dj., from which it has no constant structural differences.

Bembidium callosum, Kust. (1847) = *B. laterale*, Dj. (1831).

Bembidium riparium, Ol.—Olivier's description applying to two insects (*iricolor*, Bedel, and *lunulatum*, Four.), *riparium* should be dropped altogether.

Helochares punctatus, Sharp, is an extreme form of the variable *H. lividus*, Forst., and should be reduced to a var. of that species.

Laccobius sinuatus, Mots., is not synonymous with *nigriceps*, Th., and has not occurred in Britain. The latter name should stand.

Homalota eremita, Rye (1867) = *islandica*, Kr. (1857).

Meligethes gagatinus, Er., should be raised to a species. The characters are quite different from those of *lugubris*, Er. (Reitt., *Rev. Mel.*, p. 110).

Rhynchites sericeus of *Brit. Cat.* = *ophthalmicus*, Steph., *R. sericeus*, Hbst., is not British (*Ent. Mo. Mag.*, vol. xl., p. 79).

The following species are noteworthy from their extreme rarity, or for some other reason call for special remark.

Bembidium andreae, F. = *B. anglicanum*, Sharp, according to Messrs. Beare and Donisthorpe. In the 1891 *European Catalogue* they are not synonymous, *anglicanum* = var. *bualei*, Desb. *B. femoratum*, Sturm., is also considered a variety of *andreae*, F.

Ilybius subaeneus, Er., has been considered rather a doubtful British insect. I have seen a series taken by Mr. Thouless, in Norfolk, which are no doubt *subaeneus*, the abdominal male characters are quite different from those of *fenestratus*, F.

Xantholinus distans, Kr. The specimens in British collections, under this name, are most probably *cribripennis*, Fauv.

Trogophloeus subtilis, Er., is extremely doubtful as British. There appears to be no trustworthy record.

Bledius femoralis, Gyll., has recently been reinstated as British by Dr. Norman H. Joy (*Ent. Mo. Mag.*, vol. xl., p. 237). The determination has since been confirmed by M. Fauvel.

Scymnus lividus, Bold, is a very doubtful species, and should be placed in the separate list.

Meligethes bidentatus, Bris., appears to have no British representative, and should be placed in the doubtful list.

Corticaria obscura, Bris., is another doubtful British species. It is extremely rare on the continent.

Silvanus bidentatus, F.—It is very desirable to have further confirmation of this insect as British. It is easily confused with its allies.

Athous subfuscus, Müll., appears only to have been taken in the Orkney and Shetland Islands. I can find no more recent record than 1867. The specimen from Llangollen (*Brit. Col.*, vol. iv., p. 102), seems to have been an error.

Hypera elongata, Pk., is represented in the Power collection by a rubbed male of *H. suspiciosa*, Hbst. This mistake is not uncommon in foreign collections. Prof. Beare has recently recorded the capture of a specimen near Edinburgh (*Ent. Mo. Mag.*, vol. xxxvii., p. 2).

Thryogenes scirrhosus, Gyll.—Most of the localities given by Fowler apply to *T. nereis*, Pk. The examples in the Power collection are certainly wrongly named. The insect, if British, must be exceedingly rare.

Dorytomus affinis, Pk., a very doubtful native, I cannot find a trustworthy record.

Anthonomus conspersus, Desb., appears to be doubtfully distinct from its allies.

Anthonomus britannus, Desb.—I cannot satisfactorily refer the specimen in the Power collection to any of the other British species.

Rhyncolus gracilis, Rosen.—The only recent record is that of

Mr. Blatch. Mr. Willoughby Ellis tells me that he also has taken the insect at Knowle, near Birmingham, but I believe he has not recorded it.

Ceuthorhynchidius pulvinatus, Gyll.—The characters usually given to separate this from *pyrrhorhynchus*, Marsh., *i.e.*, the colour of the legs and rostrum, are quite useless. The differences between the two species want clearly defining, if, indeed, they are really distinct.

Polygraphus pubescens, Bach. I have reason to think there is some error about Lawson's record.

Cryptohypnus pulchellus, L. If correctly determined, this appears to be one of our rarest species. There is but one record, in 1868 (*Ent. Mo. Mag.*, vol. v., p. 139).

Trigonogenius globulum, Sol.—If this species is admitted in the list, as I think it ought to be, *Ptinus tectus*, Boield, which is much more common and widely distributed, must also find a place. Both are apparently naturalised and have come to stay.

Ernobius abietis, F.—The specimen in the Power collection I refer to *E. mollis*, L. The insect should be placed among the "doubtfuls."

Clytus arcuatus, L., should be placed in the introduced list. It does not appear to breed in this country, all the specimens found have come from foreign timber in which they were imported in the larval or pupal state.

In a former paper (*Ent. Rec.*, vol. xvi., p. 80), I called attention to the alterations in synonymy, proposed by M. Bedel (*Faune Seine*, vol. v.), and also of more consequence to British coleopterists—the species which should be added or deleted from our lists, as far as my study of M. Bedel's valuable work has enabled me to form an opinion. The whole group, especially the genus *Thyamis*, requires a careful study with a view to the revision of the British species, I have, therefore, omitted the *Phytophaga* altogether in this paper.

Salpingus ater, Pk.—No satisfactory records. Those that exist probably refer to *aeratus*, Muls.

Apion ryei, Blkn., is probably a variety of one of the other red-legged species. It differs very little from *apricans*, Hbst.

Sitones brevicollis, Sch., is represented in the Power collection by small *tibialis*, Hbst., a very variable species both in form and colour.

Polydrusus sericeus, Schal.—This insect was recently taken in Harewood Forest, Hants. in some numbers, by Dr. Norman H. Joy (*Ent. Mo. Mag.*, vol. xl., p. 182). It had not been recorded for many years previously.

I shall be much indebted to any one who can give me details of capture or other information concerning any of the numerous species mentioned in this paper, and will willingly examine any specimens sent to me for that purpose.

Remarks on Mr. Newbery's final Article on some Doubtful or very Rare British Coleoptera.

By (Prof.) T. HUDSON BEARE, B.Sc., F.E.S., and H. DONISTHORPE, F.Z.S., F.E.S.

It seemed to us desirable to publish some reply to Mr. Newbery's remarks in his concluding article on doubtful or very rare British *coleopters* simultaneously with Mr. Newbery's article, and we have,

therefore, prepared the following remarks in reference to the species with which Mr. Newbery deals.

Anchomenus puellus, Dj.—Canon Fowler certainly says that *puellus* is probably only a var. of *thoreyi*, Dj., but Dawson in his *Geodephaga Britannica* treats them as distinct, and we are by no means convinced that *puellus* is merely a variety; one does not take the two together as a rule, and they appear to have structural differences as marked as many other insects which are readily admitted to be specific in their differences.

Bembidium callosum, Küst.—The reason why we adopted *callosum*, Kust., 1847, in place of *laterale*, Dj., 1831, was that *callosum* was the name adopted by Dawson when recording the species, and we considered it best to adhere to that name in the catalogue when reintroducing it.

Bembidium riparium, Ol.—It was pointed out by Canon Fowler (*Ent. Mo. Mag.*, vol. iv., 1893, p. 251), when Mr. Newbery's original note was published, that the introduction of the specific name, *lunulatum*, Four., would probably lead to confusion with *lunatum*, Duft., and for this reason we preferred to retain the name of *riparium*, Ol.

Helochares punctatus, Sharp.—As regards the two species of *Helochares*, Dr. Sharp, who introduced *punctatus* (see *Ent. Mo. Mag.*, vol. iv., p. 241), gives very clearly the specific differences, and, undoubtedly, he is the authority in this country on water-beetles, and, therefore, we did not feel justified in reducing *punctatus* to a mere variety of *lividus*, Forst.; further, we are by no means convinced that it is a variety.

Laccobius sinuatus, Mots.—According to the *European Catalogue*, p. 68, Mr. Newbery appears to be correct in his synonymy with regard to the two species, *Laccobius sinuatus*, and *L. nigriceps*, Th., but as the matter appeared to be uncertain, we decided to follow Canon Fowler in his *British Coleoptera*.

Homalota eremita, Rye.—The same remarks apply to the question of the priority of *Homalota eremita*, Rye, and *islandica*, Kr. Dr. Sharp, in his "Monograph on the genus *Homalota*," retains the name *eremita*, Rye.

Meligethes gagatinus, Er.—In reference to *Meligethes gagatinus*, Er., we do not understand Mr. Newbery's remark that this should be raised to a species; it is a species in our catalogue.

Rhynchites sericeus, *Brit. Cat.*—The fact that *Rhynchites sericeus*, *Brit. Cat.*, is *Rhynchites ophthalmicus*, Steph., was pointed out by Mr. Champion (*Ent. Mo. Mag.*, 1904, p. 79), after the appearance of our catalogue; we were, therefore, not able to make the alteration; it will have to be made, of course, in any further edition.

Bembidium andreae, F.—Before deciding that *Bembidium anglicanum*, Sharp, was synonymous with *B. andreae*, F., we consulted the original description, and came to the conclusion that it was, and though, in this particular instance, Mr. Newbery wishes to follow the *European Catalogue*, he does not give any reason for doing so, and in other cases he is quite ready to depart from it.

Ilybius subaeneus, Er.—As regards *Ilybius subaeneus*, we fail to see the point of Mr. Newbery's comments; the insect was inserted in our catalogue because we had undoubted evidence of Mr. Thouless' captures.

Xanthodinus distans, Kr.—It is obviously quite impossible for the authors of a catalogue to insert or remove insects from the list on such evidence, or want of evidence rather, as shown by Mr. Newbery's notes on this species. Mr. Newbery merely says "are most probably." Has Mr. Newbery seen all the specimens of *distans*, and if not, what is the value of "most probably"? It is neither scientific, nor does it lead to accuracy, to make statements of that nature when all the specimens in collections have not been examined.

(*To be concluded.*)

NOTES ON COLLECTING, Etc.

OVIPOSITION OF HELIOPHOBUS HISPIDA.—I am now rearing some of these larvæ from bred parents. I found no difficulty in getting a pairing, but the ♀s refused to oviposit unless provided with flower-heads of grass, on which they laid freely, placing the ova anywhere along the small branches. I placed the ova on a potted plant of *Triticum repens*, and the larvæ are now about three-quarters of an inch in length, and come up to feed every night unless very cold.—PERCY C. REID, F.E.S., Feering Bury, Kelvedon. *December 19th*, 1904.

PTILOPHORA PLUMIGERA AT LIGHT.—On December 2nd I captured a ♀ specimen of *Ptilophora plumigera* at light. Is not this a very unusual date for this species?—W. K. LISTER, Great Walton, Eastry, Kent. *December 4th*, 1904.

MANDUCA ATROPOS IN IRELAND.—I have to record that a specimen of *Manduca atropos* was taken in a house at Bangor, co. Down, on the morning of September 8th.—J. E. R. ALLEN, Enniskillen. *December 12th*, 1904.

FOODPLANT OF THESTOR BALLUS.—Mr. Raine sends me a correction as to my notes on the foodplant of *T. ballus* (*Ent. Rec.*, vol. xvi., p. 284). Mr. Raine says the mistake is his, but if it is not entirely mine, I must at least share it. My note was to displace *Lotus hispidus* from the first place on the list of foodplants of *T. ballus*, and give that eminence to *Anthyllis tetraphyllus*, which is, at Carqueiranne, *the* foodplant. The correction now to be made, further displaces *Lotus hispidus*, to the position, probably, of a foodplant, possibly *the* foodplant at some other habitat of the species. Mr. Raine says that the plant which I took to be *Lotus hispidus*, Desf. (and on which he has seen *Thestor ballus*, *Colias edusa* and var. *helice* frequently deposit eggs), is *Lotus ornithopodioides*, L. "*Lotus ornithopodioides* is," Mr. Raine writes, "very common here and at Carqueiranne, and only on it have I seen *T. ballus*, *C. edusa*, and its var. *helice*, deposit eggs; I will look out for *L. hispidus* in the spring, and see if it occurs where *T. ballus* is found, and if it has any attraction for the butterfly." I am not sure that I have seen *Lotus hispidus*, it is certainly not common, at Carqueiranne. There can be little doubt that *T. ballus* would eat *L. hispidus* and many other herbaceous leguminous plants, but this further elucidation makes me still more suspicious that the original statement that *T. ballus* feeds on *L. hispidus*, may have been founded on an erroneous determination of *A. tetraphyllus*, precisely such as has recently occurred, and which I corrected. T. A. CHAPMAN, M.D., Betula, Reigate, *December* 1904.

LEPIDOPTEROLOGICAL NOTES FROM BURNLEY, ETC., 1901.—At

Burnley, on April 16th and 23rd, *Larentia multistrigaria* were plentiful, some of them being much darker than usual, one ♀ in particular being nearly as dark as the Huddersfield form. During the early spring, common larvæ were abundant at night, *Noctua xanthographa* and *Xylophasia rurea* being especially plentiful, from the latter, in early July, I bred a nice variable series, the dark and light forms being about equally divided. On May 14th, a fine *Pharetra rumicis* ab. *salicis* emerged, the larva being from Halifax. On June 12th, two *Melanippe montanata* emerged from Whitby larvæ, one quite ordinary, but the other, although the markings were normal, had the band filled in with light brown, thus, in some degree, resembling the Shetland forms. A very large *Plusia iota*, emerging on July 10th, was light-pinkish in colour, and had the spots united as in *P. gamma*. From July 16th to 19th I was in Dumfries, and took, among other things, *Polyommatus* var. *artaxerxes*, on the moors, and, at dusk, *Boarmia gemmaria* var. *perfumaria*, and *Platyptilia ochrodactyla* (? *pallidactyla*, Ed.). On the 30th, at Burnley, I took my first plume here, *viz.*, *Platyptilia gonodactyla*, also three *Crambus tristellus*. On August 3rd, two *Calymnia trapezina* appeared in the breeding-cage, one the very light form, while the other is dark, having the appearance of being mottled with purple; both larvæ were taken at Doncaster. Early in May, I took larvæ at Lytham which were quite new to me, but on their emerging on August 25th-26th they proved to be *Epunda lichenea* of a very fine dark green form, quite different from my other specimens which were from Portland. *Celaena haworthii* were very plentiful and fine on September 17th, but I did not get a single *Oporabia filigrammaria*. From a few larvæ taken here in September, several *Pyrameis atalanta* emerged, the last one on October 18th, being abnormal in only having one of the antennæ developed.—W. G. Clutten, 132, Coal Clough Lane, Burnley.

Insects on the Fife coast.—This year I spent the month of August upon the coast of Fife. Although I did not get anything very extraordinary, yet my "take" was not uninteresting. I had, before that time, collected a little during July in Scotland, and had given up the idea of getting anything worthy of preservation. All I had got previously were one *Abraxas grossulariata*, half-a-dozen *Pieris brassicae*, and a number of *Larentia didymata*. One insect I got I must not forget to mention. I came to Scotland by steamer, and when about three miles from the Berwick coast, I took a fine female *Melanippe fluctuata*. I arrived in Fife amid a downpour of rain, which, as evening approached, moderated, and allowed me to get out. I went for a walk to spy out likely localities, and was soon amid rest-harrow looking for *Heliothis umbra* (*marginatus*). A few larvæ of the green form were soon turned up, but, being so miserably small, were left. Next day was another useless day, for the wind blew a hurricane. However, as I was resting upon a hillside, a small butterfly flew past, which, resting for a while on a dandelion flower, allowed me to get close enough to see that it was a specimen of *Cupido minima*. Encouraged by this, I examined all likely and unlikely plants, to see whether or not others were at rest. I had almost given up searching in disgust, when I took hold of a head of *Campanula glomerata*, upon which I found, to my delight, a male specimen of *Polyommatus* var. *artaxerxes*. As the species was over almost a fortnight before, in Durham, I never expected to find it.

A look round showed me that a short plant, which was almost invisible, and which I had concluded was the common daisy, was *Helianthemum vulgare*. I saw no others on that day, but on the next I saw about half-a-dozen but took none. The day after was very favourable, and I took some 32 specimens, and liberated as many more useless ones. Flying along with them, and occasionally battling with them, were *Polyommatus icarus* (*alexis*), *Coenonympha pamphilus*, and *Epinephele janira*. While the last two were typical, the first species was not. The females had a white or light blue blotch in the apical angle of the forewings upon the upperside, while upon the underside the black spots nearest the basal angle coalesced to form a black crescent. Judging from the abundance of both *P.* var. *artaxerxes* and *P. icarus* (*alexis*), that ova would not be difficult to find I commenced to search. I soon found ova of *P. artaxerxes* placed upon the uppersides of the young leaves near the growing point of the plants of rockrose. Some were hatched, but others were still as laid. I collected a fair number, and we now have the larvæ hybernating upon rockrose. The larvæ, from the eggs which were hatched, had not remained upon the leaf upon which the egg was, but had proceeded to the leaf lower down, and were resting on the underside, eating the tissue of the lowerside of the leaf, The larvæ are now from 2mm.-4mm. long, and rest upon the plant. Similarly, I readily found ova of *P. icarus* (*alexis*), but was astonished at the various plants from which I obtained ova. The greater number were found upon *Lotus corniculatus* and *Trifolium pratense*, but I got six from plantain (*Plantago lanceolata*), four or five from yarrow (*Achillea millefolium*), and one from burnet saxifrage (*Pimpinella saxifraga*). The larva from these are also safely hybernating. I saw all three species of whites, but *Pieris napi* was the only common one, and the specimens are very strongly marked. I got ova from a female, and we have a fair number of pupæ from these ova. The only other species of butterfly noted was a single specimen of *Satyrus semele*, a female, which I netted, together with two *Epinephele janira*, from a knapweed head. I saw very few Geometrids, but those I did see were some which I had rarely seen before. Of course *Larentia didymata* was present in great abundance, as was also *Melanippe fluctuata*. *Eubolia mensuraria* was also to be seen in fair numbers. In gardens, *Abraxas grossulariata* and *Dictyopteryx bergmanniana* were in evidence. When I visited the campion flowers, however, I was amply repaid for my labour in climbing the cliffs. In Durham, members of the genus *Emmelesia* are very rare, and I have only met with one in the larval state—*Emmelesia decolorata*. Here, however, nearly every campion plant had on it from one to half-a-dozen larvæ of *E. decolorata* or *E. affinitata*. I collected some hundreds, but all proved stung, and I observed the common yellow and black ichneumon engaged in ovipositing. Along with the larvæ of *E. decolorata* and *E. affinitata* were a fair number of *Eupithecia venosata* larvæ. Of course, larvæ of *Dianthoecia capsincola* and *D. carpophaga* were also plentiful. When I examined the heads of *Rhinanthus cristi-galli*, larvæ of *Emmelesia albulata* were also common. The only other Geometers captured were *Cidaria fulvata*, and a single female *Acidalia dimidiata*, and I also, when I beat *Senecio jacobaea*, obtained larvæ of *E. centaureata*. I obtained ova from the specimen of *A. dimidiata*, but, unfortunately, they proved infertile. *Large numbers of Anthrocera filipendulae* were to be obtained at rest

upon flowers in the railway cutting. I searched *Galium verum* for larvæ of *Sesia stellatarum* or *Theretra porcellus*, and, although I was not successful, nevertheless the latter were present, for I found frass indicative of that species in quantity. I did very little amongst the Noctuids, still, I took a fair number. The first I took was what I set down as a worn *Tapinostola elymi*, flying along the seashore. In addition to the two Dianthœcias mentioned above, I took small larvæ of *D. cucubali* upon *Silene inflata*, upon the railway-side. Common enough also were small larvæ of *Hadena pisi*, upon rest-harrow, accompanied by a few more *Heliothis umbra*, amongst which I got one of the purple-brown form. At rest, upon a wall, I took one *Aplecta occulta* and a few *Noctua xanthographa*. As I knelt down to pick up a larva of *D. cucubali*, I found a dark female of *Noctua umbrosa*, which obligingly laid a batch of ova. Upon all the walls wherever one went were quantities of nice variable *Bryophila perla*. Upon ragwort, at night, I boxed *Leucania pallens*, *Miana literosa*, *Triphaena comes* (*orbona*), *Noctua xanthographa*, *Apamea oculea*, and *Agrotis corticea* [Very late. Ed.]. These species were all I saw, but still I felt amply repaid for my holiday, as I had met with larvæ of several species I had never seen in their early stages before.—J. W. H. Harrison, B.Sc., The Avenue, Birtley, R.S.O., Durham. *November 27th*, 1904.

Autumnal lepidoptera in the New Forest and Bromley.—A few days in the New Forest in October last, gave me the impression that the results of autumnal sugar there were inferior. Most of the usual insects occurred, bnt not in numbers, and the most noticeable point was the large number of Geometrids, chiefly *Thera variata*, but with many *T. firmata* and *Cidaria psittacata* that were attracted on one particular evening. Towards the end of August, sugar appeared to be particularly attractive here, but the quality was, as usual, poor, the best insect captured being *Cirrhoedia xerampelina*.—B. W. Adkin, F.E.S., Trenoweth, Hope Park, Bromley, Kent. *October 28th*, 1904.

Autumnal lepidoptera at Boscombe.—It may be worth while noting that I captured an example of *Xylina semibrunnea* at sugar here, recently, the first I have ever seen in the district. It is odd that a comparative rarity like *X. semibrunnea* should occur at sugar, whilst most of the usual common species—*Orthosia macilenta*, *Anchocelis lunosa*, &c., were absent. Ivy is only attracting *Orthosia macilenta* and *Orrhodia spadicea*.—(Major) R. B. Robertson, Forest View, Southborne Road, Boscombe. *November 1st*, 1904.

CURRENT NOTES.

We should esteem it a great favour if any lepidopterist—(1) who has bred any species by crossing a typical form with its variety or aberration, *e.g.*, *repandata* and *conversaria*, *prunaria* and *sordiata*, *aversata* and *remutata*, *hera* and *lutescens*, *lubricipeda* and *radiata*, *monacha* and *eremita*, *betularia* and *doubledayaria*, *omicronaria* and *obsoleta*, *plantaginis* and *hospita*, &c., and has a record of the results; or (2) who has already published such results—will send us the reference, or a short summary of the experiment, for publication in a technical paper on "Hybridism and Mongrelisation," which we have largely prepared for the 5th volume of *British Lepidoptera*. What we

want are:—(*a*) Exact parentage. (*b*) Exact number of each form like the parents bred. (*c*) Number of intermediates—with the sexes in each case, if possible.

On Sunday morning, December 11th, 1904, passed calmly away, Charles G. Barrett, for half-a-century past one of our most prominent students of British lepidoptera. His earlier work was, as usual, as a collector, differing from most of us in his untiring energy and enthusiasm. We find in 1856, in the *Ent. Wk. Intelligencer*, vol. i., p. 165, a note from him relating how he saw from the train two *Colias edusa* flying on the railway embankment near Forest Hill, and got out at the next station and went back and caught them. He was one of the earliest workers at lamps, and in those days it was always easier for him to swarm the post than to resort to any other means of securing a desired insect. Space would not allow us to mention the large amount of work he has done in working out life-histories, in taking rare or new species, or in enlarging our faunistic knowledge, especially in South Wales, at Haslemere, and in Norfolk. For many years he was active both in societies and contributions to the entomological magazines, and was always pleased to assist others in any of the directions in which he was himself so well qualified. Latterly he had been less active in the field, but still contributed much to our knowledge, extending his view to South African lepidoptera. For the past ten years his energies have been devoted to *The Lepidoptera of the British Islands*, of which ten portly volumes have already appeared. It will long be a monument to his memory amongst British lepidopterists. It is remarkable for many excellences, as well as for some defects, which it is, indeed, impossible for any results of human labour entirely to escape. We believe the remainder of the Tortricids, amongst which the publication at present is, is ready for the press. Outside entomology his life was devoted to the Inland Revenue service, from which he retired a few years ago. A marked feature of his character was, that his religious convictions were not merely pious opinions, but governed him in all the relations of life.

This pamphlet, "*Eine Sammlung von Referaten uber neuere biometrische Arbeiten mit einzelnen Anmerkungen*," by Dr. Chr. Schröder, is a reprint of notes appearing in the *Allgemeine Zeitschift fur Entomologie*, vol. ix., pp. 228-246. Having regard to the express use of the word "biometrische," it would have been better to confine the selection more strictly to biometric work. A long notice of Professor Eelage's treatise on heredity is quite out of place under the circumstances. In his introductory remarks, Dr. Schröder decides not to summarise certain memoirs—"zumal es in allgemeinen auch der Naturwissenschaftlern an der Verkentnissen der Grundlagen der biometrischen Forschung gebricht, ohne welche jene Arbeiten unverstanden bleiben wurden." We fear this consideration has not been allowed sufficient weight. The abstract of Dr. Warren's paper on parthenogenesis in Aphis will not impress greatly those unacquainted with biometric nomenclature. Notwithstanding these defects, we welcome the pamphlet, and think it likely to be of service in calling the attention of entomologists to a subject of great and increasing importance.—M. G.

The Officers and Council of the Entomological Society of London for 1905 are as follows:—President: Frederic Merrifield, F.E.S.

Treasurer: Albert Hugh Jones, F.E.S. Secretaries: Henry Rowland Brown, M.A., F.E.S.; Commander James J. Walker, R.N., F.L.S., F.E.S. Librarian: George C. Champion, F.Z.S., F.E.S. Council: Gilbert John Arrow, F.E.S.; Lieutenant-Colonel Charles Bingham, F.Z.S., F.E.S.; Dr. Thomas A. Chapman, M.D., F.Z.S., F.E.S.; James Edward Collin, F.E.S.; Dr. Frederick A. Dixey, M.A., M.D., F.E.S.; Hamilton H. C. J. Druce, F.Z.S., F.E.S.; Herbert Goss, F.L.S., F.E.S.; William John Lucas, B.A., F.E.S.; Prof. Edward B. Poulton, M.A., D.Sc., F.R.S., F.E.S.; Louis Beethoven Prout, F.E.S.; Edward Saunders, F.R.S., F.L.S., F.E.S.; Colonel John W. Yerbury, R.A., F.Z.S., F.E.S. The annual meeting will be held on January 18th, 1905, at 8 p.m., when Prof. E. B. Poulton will read his retiring Presidential Address.

British lepidopterists who hunt European butterflies have, on the whole, an excellent reputation for accuracy in naming their captures among their continental *confrères*, but, with the increase in our numbers, and a failure to edit evident errors out of existence, this reputation looks like being lost. In the *Entomologist*, last year (1903), Mr. Denis Turner recorded the common *Coenonympha arcania* from Brittany as *C. iphis* (see *anteà*, xv., p. 273). In the current number of the *Entomologist*, p. 301, Mr. Meade-Waldo states that he found *Vanessa egea** tolerably common at Gacé in Normandy. He may have done so, of course, but we feel we should like to see some of these specimens, and also those of one or two other species reported as captured. Pictures of common European butterflies are not difficult to get for reference. We notice also, in the same number of the *Entomologist*, that Mr. G. H. Gurney, in this year (1904), at Guines, between Boulogne and Calais, found *Apatura iris* just out on August 20th, whilst *Limenitis sibylla* swarmed on every side, and *A. selene* and *A. euphrosyne* were common enough with *A. paphia* in beautiful fresh condition, and *A. adippe*, worn, &c., whilst *Thecla w-album* and *T. pruni* were both occurring with *T. quercûs* and *T. betulae*. From June onwards, the season this year (1904) has been in central Europe remarkably early, and we suspect something hopelessly wrong here as to dates or captures, and that some of the fifty species of British butterflies which "one may get here in June, July, and August," have been unwittingly added to those actually caught on August 20th and the following days. The French entomologists will have much real fault to find with perfidious Albion, if many records like these find place in our entomological magazines. We applied to Mr. Gurney for a sight of these captures, and were informed we might see them if we called on him in Norfolk, Mr. Gurney naïvely adding: "If you look at any of the standard works on European butterflies you will find that the majority of the 'Hairstreaks' fly in August," &c. We wonder which of the "standard works" we ought to refer to.

Mr. E. A. Butler records (*Ent. Mo. Mag.*) the addition of two species of Hemiptera to the British list. The first of these is *Drymus*

* To make sure that we ourselves were not at fault, we dropped a note to M. Oberthür, who writes: "*Vanessa* (*Polygonia*) *egea* does not appear to go west beyond Montpellier. I have never seen it in the Pyrénées-Orientales, although not rare in the Alpes-Maritimes, particularly in the environs of Nice. Northwards *egea* does not occur beyond Avignon. The species inhabits the south-east of France; it does not live in the south-west; it has never been found in the centre or north. The species has never been taken in Normandy."—Ed.

pilicornis, Muls., taken in a chalkpit at Abinger Hammer, near Gomshall, Surrey, which he compares with *Drymus confusus*, Horv. The second is *Salda setulosa*, Put., a single ♀ having been taken in August last, amongst flood-refuse on the southern side of Poole Harbour. This he compares with its ally, *S. opacula*, Zett.

Mr. Lamb records (*Ent. Mo. Mag.*) the addition of the Drosophilid, *Periscelis annulata*, Fall., to the British list, on the strength of specimens taken in June last, at sap flowing from a beech-tree in the New Forest, and at sap flowing from an elm near Cambridge. He also adds the Ephydrid, *Ochthera mantispa*, Lw., to the British list, from a single specimen taken in September, at Porthcothan, near Padstow, in North Cornwall.

Mr. Barrett records (*Ent. Mo. Mag.*) that *Doryphora palustrella* has been bred from larvæ found mining the stems of common dock, by Mr. W. Purdey, of Folkestone. At Deal, where we have taken it, we had certainly never noticed that it appeared to have any special connection with the plant.

As we noted (*antea*, p. 276), Mr. Arkle has redescribed *Apleeta nebulosa* ab. *robsoni*, Collins, as var. *thompsoni*, Arkle. We point out (*Ent. Mo. Mag.*), by quotation from Mr. Arkle's own description, that, in all the essential points relied on, Mr. Arkle's *thompsoni* tallies with one of the types of *robsoni* in our possession. Mr. Arkle now discovers that these extracts taken from his original description and applied to one of the *robsoni* types do not belong to *robsoni* or *thompsoni*, but to something between the two. Since *robsoni* = *thompsoni*, one wonders where the intermediate between them comes in. He says he is prepared to give data as to the distribution of *robsoni*, which, he asserts on the credit of others, occurs in Yorkshire, but strangely enough offers none.

Mr. Tomlin records *Ripersia europaea*, Newst., from nests of *Formica fusca*, on the cliffs near Swanage, in September last. It was excessively abundant although an addition to the British list.

Mr. Verity gives (*Bull. Ent. Soc., France*, 1904, p. 233) a note on the egg and first stage larva of *Parnara nostrodamus*. We hope he will try and get the insect through next year, and send some of the eggs and larvæ, in their various stadia, to England for exhibition.

Dr. Alfken describes some gynandromorphic Apids—*Andrena humilis*, *Prosopis kriechbaumeri*, *P. pratensis*, and *Sphecodes gibbus* (*Soc. Ent.*, p. 122).

Dr. Sharp (*Ent. Mo. Mag.*) records the capture of *Criocephalus rusticus*, Dej., by Colonel Yerbury, during the past summer, when searching for *Callicera yerburyi*. Mr. Champion has also determined some metallic-green beetles, taken on flowers of convolvulus on the sandhills at Hunstanton, on June 21st, 1899, by Mr. Thouless, as *Malachius barnevillei*, Puton.

In our current note (*antea* p. 340) relative to the death of Mr. J. Carter, we were in error in stating that Mr. Carter had been a life-long lepidopterist. He was a geologist of repute, whilst his son, Mr. J. W. Carter, the well-known lepidopterist, has recently been elected as President of the Entomological Section of the Yorkshire Naturalists' Field Club for 1905. We much regret the unfortunate blunder.

ERRATUM IN LIFE OF GNOPHOS GLAUCINARIA.—The ♂, whose eggs are described (*Ent. Rec.*, xv., p. 338) as those of *Gnophos glaucinaria*, appears to be a worn specimen of *G. dilucidaria*.—L. B. PROUT. December 18th, 1904.

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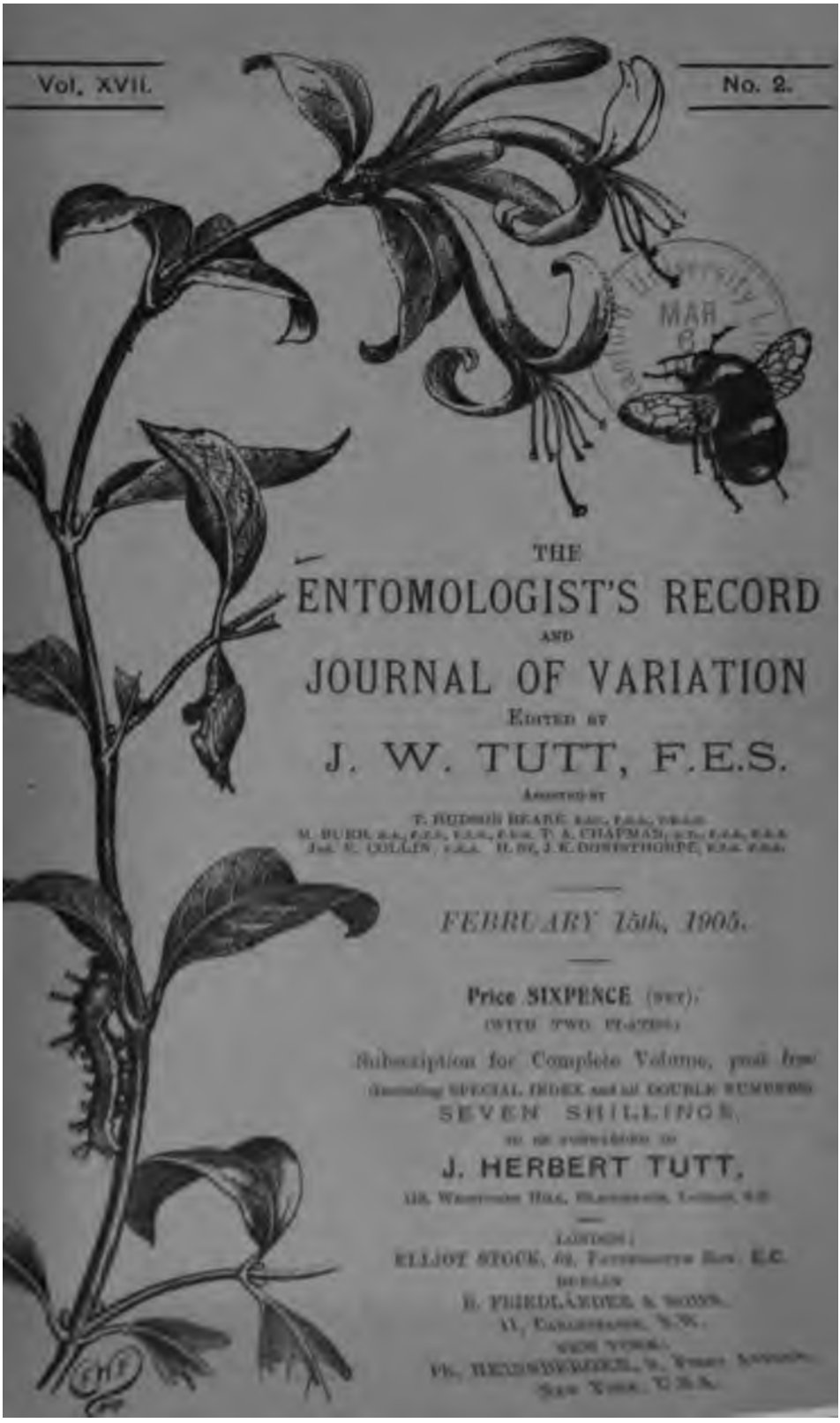

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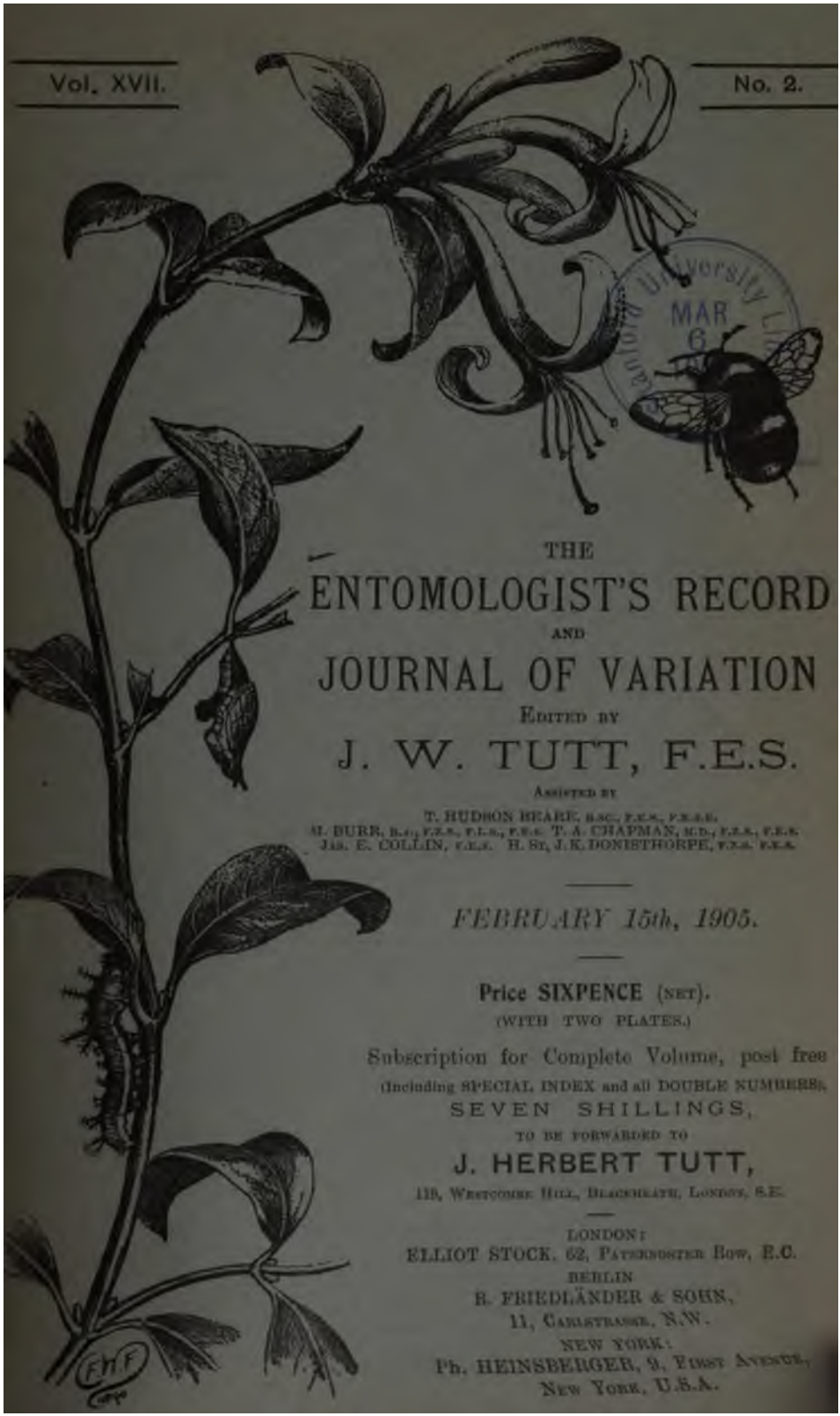

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BASTIN BROTHERS, THE HATHERLEY ROOMS, READING.

Mr. Newbery gives a valuable table for separating the five species of this genus now found in this country. In addition to these species Mr. W. E. Sharp records (*Ent. Mo. Mag.*, vol. xl., p 48) the capture of a definite and apparently hitherto unnoticed variety of *Hyphydrus ovatus*, L. The specimen was taken near Lowestoft, in April, 1903. Mr. Tomlin also introduces (*Ent. Mo. Mag.*, vol. xl., p. 183) var. *nigrita*, Weis., of *Lochmaea suturalis*, Th., which was captured at Cannock Chase. This var. has also been taken by Mr. Wm. Evans, at Kirknewton, in Scotland. These complete the genuine additions to our fauna during the past year, seven new species and two new varieties.

Of changes in synonymy, we have one important one due to Mr. Champion, who points out (*Ent. Mo. Mag.*, vol. xl., p. 79) that *Rhynchites sericeus*, Hbst., is not a British insect. *R. ophthalmicus*, Steph., which has generally been assumed to be synonymous with *sericeus*, is really synonymous with *olivaceus*, Gyll., this latter name postdating that of Stephens by a couple of years.

The new *Ptinus*, which I referred to in my "retrospect" for 1903 as having been recently identified as *tectus*, was put on formal record by a note I contributed to the *Ent. Mo. Mag.*, vol. xl., p. 4, in which an account was given of the distribution of this insect and of the history of its discovery in this country. Since this note was published, it has been recorded from several other localities Hoylake, Liverpool, and Holborn, London. Mr. Champion states that he has recently had specimens of this insect sent, for identification, from Tasmania, where it was supposed to have been introduced along with *Trigonogenius globulum*, Sol., another of the species now being distributed by commerce all over the world.

I can only refer to a small number of the interesting records of captures during the past year. *Calosoma sycophanta*, L., has turned up again, a specimen having been taken near Epping by Mr. E. Smith. In the *Ent. Record*, vol. xvi., p. 78, Mr. Tomlin gives a few notes as to the range of *Tropiphorus obtusus*, Bons., in this country. I may mention that, in addition to the localities Mr. Tomlin gives, I have taken it myself, in fair numbers, at Rannoch, in company with *T. mentosus*, Marsh. The question as to whether these two insects are different sexes of one species was discussed at a meeting of the Entomological Society of London, but, at present, we have not sufficient data upon which to form any definite conclusion. Mr. Donisthorpe records the capture, as far back as 1888, of a specimen of *Peritelus griseus*, Ol., at Purley. This insect is very local and rare in this country, having apparently been taken previously only in the Isle of Wight; there are no records of its capture for many years. *Bembidion adustum*, Schaum., has again been taken in its old locality at Tewkesbury, by Mr. Donisthorpe and the writer. The second recorded specimen of *Orchestes spartii*, Fahr., was taken by Mr. Donisthorpe in the New Forest during August of last year. Dr. Joy records the capture of *Medon dilatus*, Er., hitherto unique in British collections, by the late Mr. C. E. Collins, at Tubney Wood, Oxford. The var. *metallescens*, Rye, of *Harpalus latus*, L., was taken by Mr. W. E. Sharp, at Boxhill. *Apion brunnipes*, Boh., a very rare insect in this country, was taken by Mr. Holland, near Oxford, in June, 1903. Mr. J. J. Walker and Mr. Champion have taken *Bagous tarsalis*, Gyll., at its old locality, Horsell Common; this appears to be the first record of its capture since the

time of Dr. Power. *Orochares angustatus*, Kr., another unique, has been captured by Dr. Joy at Bradfield. *Lamia textor*, L., was taken by Mr. P. H. Jackson in North Wales, near Harlech, last June. *Bledius femoralis*, Gyll., which has never been taken in this country since the date of Mr. G. R. Waterhouse's captures, when it was introduced into our list, was taken in some numbers by Dr. Joy, in the Wokingham district. The same gentleman has taken *Bledius taurus*, Germ., in numbers in its old locality on the Norfolk coast—the Wells marshes. After this record was published, Mr. Champion, on going through his collection, found he had taken specimens of *B. femoralis* at Mickleham and Woking. I found *Aphanisticus emarginatus*, F., introduced into our list last year by Mr. Donisthorpe, at the locality in which he took it, Parkhurst Forest, in September last. One of the longicorns recently introduced, *Tetropium castaneum*, L., has been taken at King's Lynn, Norfolk, and, in connection with the record of this capture, Mr. Newbery publishes a note (*Ent. Mo. Mag.*, vol. xl., p. 86), on the characters for separating *fuscum* and *castaneum*. I captured a single specimen of *Cathormiocerus socius*, Boh., in September last, near Ventnor; this is a new locality in its headquarters, the Isle of Wight.

A number of articles of considerable interest have been published in our entomological journals during the past year. Mr. Newbery contributes (*Ent. Record*, vol. xvi., p. 80) some notes on M. Bedel's "Coléoptères du Bassin de la Seine," Tome 5, Fas. 2, dealing with the changes of synonymy which will probably have to be made in the *Phytophaga* of the British catalogue. As I propose later on to go more fully into the question of these proposed changes, it is not necessary here to do more than draw attention to Mr. Newbery's important note. Mr. W. E. Sharp discusses (*Ent. Record*, vol. xvi., p. 90) the differences which have been given for separating the two species *Agabus unguicularis*, Th., and *Agabus affinis*, Pk. Mr. Edwards (*l. c.*, p. 187) criticised this note, and Mr. Sharp replied to this criticism on p. 247. Personally I have found no difficulty in separating the two species, or what I consider to be the two species, by what Dawson termed the "general habit" of the beetles. I have taken both species—*affinis* in numbers in flood-refuse at the reservoirs near Edinburgh—and *unguicularis* at Askham bog—and when the species from these two localities are placed side by side, there is no difficulty in picking them out. Dr. Joy contributes (*Ent. Record*, vol. xvi., p. 89) a note on the larvæ of *Cossus ligniperda* and the coleoptera which haunt its burrows, giving a long list of the species that he has taken in this habitat, many of them rare ones. Mr. Donisthorpe gives (*Ent. Record*, vol. xvi., p. 150) some interesting experimental proofs of the distastefulness of *Meloë violaceus*, Marsh., and the edibility of *Dermestes murinus*, L. The experiments were made at the Zoological Gardens; the former insect was rejected by all the animals tried, while the latter was greedily devoured. On p. 301, Mr. Donisthorpe gives a note on the Myrmecophilous habits of *Cetonia aurata*, L.; he was able to rear larvæ of this insect, taken originally in the New Forest by Prof. Poulton, in his experimental nest of *Formica rufa*. Mr. E. J. B. Sopp contributes (*Ent. Record*, vol. xvi., p. 151) a note on "An immigration flight of *Aphodius inquinatus*, Fab.," on the Lancashire coast on April 16th, 1904. In the *Ent. Mo. Mag.*, Mr. J. J. Walker continued his valuable and important paper on "A Year's Insect-Hunting in New Zealand," a paper valuable not only on account of the number of

species, the capture of which is recorded, but on account of the copious notes as to habits and manner of life of many of the species.

Mr. G. J. Arrow contributes (*Ent. Mo. Mag.*, vol. xl., p. 35) a note on two species of coleoptera introduced into Europe from the East, *Minthea rugicollis*, Walk., and *Laemotmetus rhizophagoides*, Walk., the synonymy of which has been terribly confused. In a note to this contribution, Mr. Champion refers to another of these peculiar species, *Pharaonotha kirschi*, Reitt., the synonymy of which has also been very much confused. Small beetles like these, which are transported by commerce to all parts of the world, and which, apparently, readily establish themselves in the districts into which they are introduced, are almost invariably described two or three times over, with consequent confusion in synonymy. Mr. A. J. Chitty describes (*Ent. Mo. Mag.*, p. 100) an interesting method of collecting, chiefly coleoptera, in old hedges, near Faversham, Kent. He points out that he obtained no fewer than 78 species out of a 38-foot length of old hedge, including such rarities, in fair numbers, as, *Anthribus albinus*, L., and *Tropideres niveirostris*, F. Having had the pleasure of a day's collecting with Mr. Chitty at these old hedges, I can testify to the interesting character of their fauna, and the striking lessons given of adaptation, for protective purposes, to their surroundings of many of the beetles which occur in these old lichen-covered hedges. In the *Ent. Mo. Mag.*, p. 133, Mr. E. A. Newbery points out that certain of the species in the Power collection at the British Museum appear to be erroneously named. Attention, however, had been previously drawn to one of these, and Mr. Newbery does not appear to be correct in regard to, at least, one of the species which he states to be erroneously named.

The coleopterous fauna of the Isle of Man has received a considerable amount of attention during the past year. I have already referred to the new species, *Longitarsus curtus*, Al., taken there by Mr. Tomlin, and, in the article already referred to (*l. c.* p. 177), Mr. Tomlin gives a long list of his other captures in the island during the month of September, 1903. Dr. Bailey, who is resident on the island, makes an appeal (p. 137) for notes in reference to the coleoptera of the island, as he is busy preparing a local list, and he gives (p. 180) complete details of local captures of the genus *Otiorhynchus*. Dr. Cameron describes two new species of *Diglossa* (*Ent. Mo. Mag.*, p. 157) from the island of Perim; there are now six species of this strange and interesting genus of *Staphylinidae*, all occurring on the sea-coast. The papers on coleoptera published in the *Transactions of the Entomological Society of London* for 1904 are well up to the average in numbers and in interest, *e.g.*, Mr. G. J. Arrow in Part IV of 1903 (p. 509), which appeared too late for any reference to it in my "retrospect" for 1903, concludes his account of "Lamellicorn Coleoptera collected in the islands of St. Vincent and Grenada by Mr. H. H. Smith;" the present paper deals with the Laparostict group; of the twenty-two species taken, nine were already known as inhabiting the American mainland, two occur in other islands of the Antilles, and, of the remaining eleven, ten are described by the author in this paper for the first time. Mr. F. Muir and Dr. D. Sharp contribute to the 1904 *Transactions* (p. 1), a paper "On the egg-cases and early stages of some Cassididæ." The egg-cases dealt with were discovered by Mr. Muir in South Africa, and, for the first time, we have definite facts as to the formation of ootheca by members of this family. In addition to details of the

oothecæ of some eight species, full accounts are given of the nature and habits of the larvæ of these species; one of them, *Cassida murana*, is a species new to science, and a description of it is given. The latter part of the paper deals with several points of general interest in connection with the subject, such as the protection the oothecæ offer to attacks from parasites and other enemies. The paper is illustrated by a set of beautiful plates of oothecæ, larvæ, etc., of these species, drawn by Miss M. A. Sharp, who must be warmly congratulated on her work. Mr. Champion has (p. 81) a paper on similar lines to the one he published last year on "An entomological excursion to Moncayo, N. Spain," with long lists of Coleoptera and Hemiptera taken during the month spent on the trip, and Dr. Chapman contributes, as a supplement to this paper, a note on "The life-habits of *Xyleborus dispar*, Fabr.," a colony of the beetle having been found at Moncayo. It may be remembered that Miss Ormerod, at one time, feared that this insect was likely to become an orchard pest in this country; fortunately this has not come about, and the beetle has never occurred in any numbers again in this country since the sudden outbreak in the orchards at Toddington, near Cheltenham, in 1889. Mr. Champion and Dr. Chapman, by their repeated visits to Spain, are doing much to make known the insect fauna of that country to British entomologists, and their papers probably do much to stimulate interest in the wider continental aspect of our subject as opposed to the purely insular study to which so many of our workers are inclined to limit themselves. The last piece of work of that indefatigable, exact, and conscientious entomologist, the late Mr. F. Bates, is contained in a paper on "A revision of the subfamily *Pelidnotinae* of the coleopterous family *Rutelidae*, with description of new genera and species" (p. 249), which, having been left by the death of its author not quite complete, was prepared for publication by Mr. G. J. Arrow. A table of the genera of *Pelidnotinae* is given, and of the species of the genus *Pelidnota*, with full descriptions of thirteen new species of the genus; types of all of these (except three in the Royal Museum at Brussels) are in the British Museum. The paper concludes with the description of three new genera to the subfamily and four new species belonging to these new and other genera. Mr. A. M. Lea has (p. 329) a long paper, "Notes on Australian and Tasmanian Cryptocephalides with description of new species." The author in his introduction enlarges upon the difficulties introduced into the study of this subfamily by the way in which genera have been proposed on the slightest of grounds. After his examination of probably the largest collection both of species and of specimens ever studied by any one entomologist, he states that he did not consider it advisable to attempt to apportion previously described species into genera, preferring to refer to them by the genus in which they were originally described. A complete tabulation of the 173 species dealt with is given, and then detailed accounts of habitats, and reference to previous descriptions; the author himself describes, for the first time, no fewer than 75 species. It will be seen, therefore, that this paper is one of the most valuable on Australian coleoptera which have appeared for some years, and it will be indispensable for workers at the beetle fauna of the great island continent. In Part IV, the last so far issued, is Mr. G. J. Arrow's most interesting and valuable article on "Sound production in the Lamellicorn beetles," a model of careful work and accurate deductions, and a perfect storehouse of information on this

subject. The author gives in this paper, an account (extracted from Dr. Ohaus' original record in the *Stettiner Entomologische Zeitung*, 1900, p. 164) of the family life of certain species of the *Passalidae*, which reads more like a fairytale than the sober record of a naturalist's study of insect economy; these observations of Dr. Ohaus have overthrown definitely the old theory that social life is unknown amongst beetles, and we are finding out that there is as much to be learnt from exhaustive and carefully organised study of the earlier stages of beetle life as there is in the study of the communities of the social hymenoptera. I have no hesitation in saying that Mr. Arrow's paper is one of the most noteworthy contributions made by British coleopterists to natural science during the past few years. In connection with this subject of stridulatory organs, Dr. Sharp published a note in the *Ent. Mo. Mag.*, vol. xl., p. 277, pointing out how an organ originally designed for a certain purpose, might, in course of time, be adapted for another.

The year has seen the issue of the latest "Catalogue of British Coleoptera," prepared by Mr. Donisthorpe and the writer, and following in its arrangement of families and genera that adopted by Canon Fowler in his "British Coleoptera." Mr. Newbery made (*Ent. Record*, vol. xvi., p. 204) some comments on the rarer and doubtful species in this list, to which the authors of the catalogue replied (p. 289).

The concluding section of vol. 5 of M. Bedel's work *Faune des Coleoptères du Bassin de la Seine*, has become available to British coleopterists; this completes the section Phytophaga. Every British coleopterist, who desires to become something more than a mere collector, should possess this work; the low price at which it is issued puts it within the reach of every one, and no satisfactory work can be done at our beetle fauna without constant reference to the pages of M. Bedel's book, and to the works of Herr Ganglbauer and those of others of the leading continental coleopterists.

The year has again been one of progress, and of promise for the future, especially as several of our younger recruits seem bent on doing something better than merely walking in the footsteps of those who have gone before, and are devoting themselves to the study of the life-history of beetles and to other equally fascinating and neglected branches of the study. May 1905, at its close, present an equally good record and an equally good prospect of advance.

Types of the genera of the Agdistid, Alucitid and Orneodid plume moths.

By J. W. TUTT, F.E.S.

Meyrick and other authors have, during the past few years, made considerable changes in the nomenclature of the Agdistid, Alucitid and Orneodid moths, many of which appear to be sound, whilst others seem to be unwarranted by the literature of the subject. As it has become imperative for me to study the literature relating to this group, I beg to offer a few facts as to the names, and should be glad of any criticism, privately, as to the details here published.

1758. ALUCITA, Linné.—Restricted by Scopoli, in 1777, to the long-legged plumes (thus excluding *Orneodes*). Type fixed as *pentadactyla* by Leske in 1779. In Walsingham and Durrant's opinion the type was fixed as *pentadactyla* by Poda in 1761.]

1762. PTEROPHORUS, Geoffroy.—Created for same species as *Alucita*, Linné. Type fixed as *pentadactyla* by Geoffroy in 1762. Falls as a synonym of *Alucita*, having same conception and same type.

1796. ORNEODES, Latreille.—Created by Latreille for the plumes, with "many feathers" in the wings. Type fixed by Latreille, in 1802, as *hexadactyla*.

1806. RIPIDOPHORA, Hübner.—Type fixed by Hübner, in 1806, as *hexadactyla*, therefore falls as a synonym of *Orneodes*, Latr.

1806. PTEROPHORA, Hübner.—Type fixed by Hübner, in 1806, as *pentadactyla*, therefore falls as a synonym of *Alucita*.

1825. AGDISTIS, Hübner.—Created by Hübner, for *adactyla*, which is therefore the type.

1825. PLATYPTILIA, Hübner.—Restricted by various authors to the true Platyptiliids as now understood. Type never having been fixed, is now named as *gonodactyla* (=*megadactyla*, Hb.).

1825. AMPLYPTILIA, Hübner.—Evidently, from the plural form used, a misprint for *Amblyptilia*. Restricted by Zeller to *acanthodactyla*, Hb., and *cosmodactyla*, Hb. Type fixed, in 1862, by Wallengren as *acanthodactyla*.

1822. STENOPTILIA, Hübner.—Restricted by Meyrick and others to the "*pterodactyla* (*fuscus*)" and "*bipunctidactyla*" groups. The type never having been fixed, is now named as *pterodactyla* (=*ptilodactyla*, Hb.).

1825. ACIPTILIA, Hübner.—This is a synonym of *Pterophora*, Hb., 1806, since it contains *pentadactyla*, Hübner's type of the latter genus. It falls with *Pterophora* as a synonym of *Alucita*.

1825. EUCHIRADIA, Hübner.—Contains *hexadactyla*, type of Hübner's *Ripidophora*, which he omits in 1825. It, therefore, falls before *Ripidophora*, with which it sinks as a synonym of *Orneodes*.

1833. ADACTYLUS, Curtis.—Type stated by Curtis to be *huebneri* (=*adactyla*, Hb.), of which he only knew the figure. All the characters of the genus are described from, and the genus is founded on, the newly-described *bennetii*, which must be considered the type.

1841. PLATYPTILUS, Zeller.—Created as an extension of *Platyptilia*, Hb., to include, in addition to species of latter genus, a part of Hübner's *Amblyptilia*. Type fixed now as *gonodactyla*, so that it falls as a synonym of *Platyptilia*, Hb.

1841. OXYPTILUS, Zeller.—Created by Zeller for the Oxyptilid section of Hübner's *Amblyptilia*. Type now fixed as *pilosellae*, Zeller.

1841. ACIPTILUS, Zeller.—Created by Zeller as an extension of Hübner's *Aciptilia*. Type now fixed as *pentadactyla*, so that it falls with *Aciptilia* as a synonym of *Alucita*.

1852. DIACROTRICHA, Zeller.—Created for *fasciola*, which is therefore the type.

1852. DEUTEROCOPUS, Zeller.—Created by Zeller for *tengstroemi*, Zell., which is therefore the type.

1862. CNÆMIDOPHORUS, Wallengren.—Created by Wallengren for *rhododactyla*, which is therefore the type.

1862. OIDÆMATOPHORUS, Wallengren.—Created by Wallengren for *lithodactyla*, which is therefore the type.

1862. MIMÆSEOPTILUS, Wallengren.—Created by Wallengren for the "*pterodactyla* (*fuscus*)" and "*bipunctidactyla*" group of Hübner's *Stenoptilia*. The latter was limited by Meyrick in 1890 to the same group, thus making *Mimaeseoptilus* a synonym of *Stenoptilia*.

1862. LEIOPTILUS, Wallengren.—Created, in 1862, by Wallengren, for the Leioptilid section of Hübner's *Stenoptilia*. Type now fixed as *tephradactyla*.

1864. SOCHCHORA, Walker.—Erected for *donatella*, which is named the type.

1864. UTUCA, Walker.—Erected for *ochracealis*, which is named the type.

1880. TRICHOPTILUS, Walsingham.—Created by Walsingham for *pygmaeus*, which is therefore the type.

1881. EUCNÆMIDOPHORUS, Wallengren.—Name created by Wallengren to replace the pre-occupied *Cnaemidophorus*: type, *rhododactyla*.

1881. PSELNOPHORUS, Wallengren.—Created by Wallengren for *brachydactyla*, which is therefore the type.

1885. HEPTALOBA, Walsingham. — Created for *argyriodactylus*, Walker, which is therefore the type.

1885. CENOLOBA, Walsingham.—Created for *obliteralis*, Walker, which is therefore the type.

1886. MARASMARCHA, Meyrick.—Created for two species. Type fixed, in 1892, by Tutt as *phaeodactyla*, Hb.(=*lunadactyla*, Haw.).

1886. COSMOCLOSTIS, Meyrick.—Erected for a single species, *aglaodesma*, which is therefore the type.

1886. SPHENARCHIS, Meyrick. — Erected for a single species, *synophrys*, which is therefore the type.

1886. DOXOSTERES, Meyrick.— Erected for a single species, *aenalis*, Walk., which is therefore the type.

1887. TETRASCHALIS, Meyrick.—Erected for *arachnodes*, which is therefore the type.

1890. GYPSOCHARES, Meyrick.—Created by Meyrick for *baptodactyla*, which is therefore the type.

1890. CRASIMETIS, Meyrick.—Created for *brachydactyla*, which is therefore the type. Sunk by Meyrick, in 1895, as synonymous with *Pselnophorus*.

1891. ATOMOPTERYX, Walsingham.—Erected for *doeri*, which is therefore the type.

1891. OCHYROTICA, Walsingham.—Erected for *fasciata*, which is therefore the type.

1891. STEGANODACTYLA, Walsingham.—Erected for two species, of which *concursa* is noted as the type.

1891. GILBERTIA, Walsingham.—Erected for *eques*, which is named the type.

1891. KARAMAGUIA, Hampson.—Erected for *aurantidactylus*, which is therefore the type.

1891. EUROLOBA, Walsingham.—Created for *fuscicostata*, which is noted as the type.

1896. CROCYDOSCELUS, Walsingham.—Created for *ferrugineum*, which is named the type.

(?) SYNOPHIA, Pag.—Created for *pyrrha*, which is therefore the type.

As Chapman has already noted, "those who have not examined the Alucitid plumes more than superficially often have the idea that they are a small group of a genus or two, but, though they are a small group as to numbers, they present as much divergence and in nearly as many lines as occurs in the large groups, *e.g.*, Noctuids or Tortricids." This is so true that we have, on biological grounds, had

to use many more names in our review of the subject, and to save duplication we publish the following names used in our work :—

GILLMERIA, n.g., type *ochrodactyla*, Schiff. (*dichrodactyla*, Mühlig).
FREDERICINA, n.g., type *calodactyla*, Schiff., Hb. (*zetterstedtii*, Zell.).
CAPPERIA, n.g., type *heterodactyla*, de Vill. (*teucrii*, Jord.).
ADKINIA, n.g., type *bipunctidactyla*, Scop., Haw.
OVENDENIA, n.g., type *septodactyla*, Tr. (*lienigianus*, Zell.).
BUCKLERIA, n.g., type *paludum*, Zell.
ADAINA, n.g., type *microdactyla*, Hb.
HELLINSIA, n.g., type *osteodactylus*, Zell. (*leucadactyla*, Haw.).
EMMELINA, n.g., type *monodactyla*, Linn.
MERRIFIELDIA, n.g., type *tridactyla*, Linné (*tetradactyla*, auct.).
PORRITTIA, n.g., type *galactodactyla*, Schiff.
WHEELERIA, n.g., type *spilodactyla*, Curt.

Temporarily, we suggest that the following is the revised catalogue of British Agdistid and Alucitid plumes. This, of course, excludes the unallied Orneodid moths :—

Superfam. : AGDISTIDES.
Family : AGDISTIDÆ.
Subfam. : AGDISTINÆ.
Tribe : AGDISTIDI.
Adactylus, Curt.
bennetii, Curt.

Superfam. : ALUCITIDES.
Family : PLATYPTILIIDÆ.
Subfam. : OXYPTILINÆ.
Tribe : CAPPERIIDI.
Capperia, Tutt
heterodactyla, de Vill.
Tribe : OXYPTILIDI.
Oxyptilus, Zell.
pilosellæ, Zell.
distans, Zell.
parvidactyla, Haw.
Tribe : BUCKLERIIDI.
Buckleria, Tutt
paludum, Zell.
Subfam. : PLATYPTILIINÆ.
Tribe : PLATYPTILIIDI.
Fredericina, Tutt
calodactyla, Schiff. (*zetterstedtii*, Zell.).
tesseradactyla, Linn.
Platyptilia, Hb.
isodactylus, Zell.
gonodactyla, Schiff.
Gillmeria, Tutt
ochrodactyla, Schiff.
pallidactyla, Haw.
Subfam. : AMBLYPTILIINÆ.
Tribe : EUCNÆMIDOPHORIDI.
Eucnæmidophorus, Wallgrn.
rhododactyla, Schiff.
Tribe : AMBLYPTILIIDI.
Amblyptilia, Hb.
cosmodactyla, Hb. (*acanthodactyla*, Tr.).
punctidactyla, Haw.
Tribe : MARASMARCHIDI.
Marasmarcha, Meyr.
lunædactyla, Haw. (*phaeodactyla*, Hb.).
Tribe : STENOPTILIIDI.
Stenoptilia, Hb.
pterodactyla, Linn.
Adkinia, Tutt
bipunctidactyla, Scop.
zophodactylus, Dup.

Family : ALUCITIDÆ.
Subfam. : OIDÆMATOPHORINÆ.
Tribe : OIDÆMATOPHORIDI.
Oidæmatophorus, Wallgrn.
lithodactyla, Tr.
Emmelina, Tutt
monodactyla, Linn.
Subfam. : LEIOPTILINÆ.
Tribe : PORRITTIIDI.
Porrittia, Tutt
galactodactyla, Schiff.
Tribe : LEIOPTILIDI.
Leioptilus, Wallgrn.
tephradactyla, Hb.
Ovendenia, Tutt
septodactyla, Tr. (*lienigianus*, Zell.).
Tribe : ADAINIDI.
Hellinsia, Tutt
osteodactylus, Zell.
Adaina, Tutt
microdactyla, Hb.
Subfam. : ALUCITINÆ.
Tribe : ALUCITIDI.
Pselnophorus, Wallgrn.
brachydactyla, Tr.
Alucita, Linn.
pentadactyla, Linn.
Subfam. : MERRIFIELDIINÆ.
Tribe : MERRIFIELDIIDI.
Wheeleria, Tutt
spilodactyla, Curt.
niveidactyla, St. (*baliodactyla*, Zell.).
Merrifieldia, Tutt
tridactyla, Linn. (*tetradactyla*, Auct.).

Erebia flavofasciata in the Engadine, compared with the Ticino specimens.

By F. E. LOWE, M.A., F.E.S.

A chat with Mr. Wheeler, in 1903, decided me to go this year (1904) to Pontresina in quest of *Erebia flavofasciata*. I had also the advantage of meeting Mr. Fison at Weesen, in June, and since he had most kindly put all his experience at my disposal, I had reasonable assurance that I should be able to lay my hand, or rather my net, on the insect as soon as it emerged, but, in this I was mistaken, for, though I followed Mr. Fison's clear instructions to the letter, and hunted many days in the locality—in which he discovered the species in 1901—not a specimen was to be found. One day, all the entomologists within reach of the 1st Restaurant on the Schaffsberg, were driven thither for shelter. In this way I made the acquaintance of Herr Max Bartel and Professor Thieme, and, to my surprise, they early began to enquire if I had taken *E. flavofasciata*. It was soon evident that up to that moment they knew nothing of Mr. Fison's discovery in 1901, as recorded by Wheeler, and that Professor Thieme regards himself as the discoverer of the Pontresina locality for this local Erebiid. He had taken it in 1903, and again this year in some abundance, and Herr Bartel had secured 20 specimens.

The insect had evidently changed its quarters, or, as I am inclined to think from a comparison of localities, the occurrence of this species on the ground above the Restaurant where Mr. Fison found it, was more or less accidental and exceptional, for the ground is hardly of the character which *E. flavofasciata* would appear to affect, and several hundred feet higher than its customary range at Pontresina.

Owing to the kindness of the German collectors, I was shown the special places where they had taken it, and, although unhappily too late, I secured three very respectable male specimens.

Herr Max Bartel, who contributed a section (Sphingids) to Rühl's second volume of *Die palaearkt. Gross-Schmetterlinge*, considers the Engadine specimens of *E. flavofasciata* to represent a local race, and as presenting an uniform variation from the Tessin type of Lieut.-Col. von Nolte, and others, and has given the Pontresina form the varietal name of *thiemei* in honour of its discoverer* (?). He has written a detailed account of his views in the November issue of the *Iris*, the organ of the Dresden Entomological Society, and kindly sent me a copy of his paper. As many of your readers probably will not see the original, I propose to give the pith of it.

After observing that there is a tendency to variation on parallel lines in other kindred species, as var. *obscura* varies from typical *E. ceto*, and var. *valesiaca* from *E. stygne*, Herr Bartel gives the following general description of the subject of his paper :—

EREBIA FLAVOFASCIATA VAR. THIEMEI, N. VAR.—A forma typica differt maculis rufis alarum omnium obsoletioribus vel duplo minoribus, punctis nigris paucior nec non minoribus, subtus alarum posticarum fascia flava angustiore. Expans. al. ant. 30mm.-31mm. (2 ♂); 31mm.-32mm (2 ♀).

Then, in more detail, he says, in effect—"This variety is much

* *Erebia flavofasciata* was captured on the Schafberg by Mr. Nicholson, senr., in 1891 and 1892 (see *Trans. Ent. Soc. Lond.*, 1898, pp. 186, 219, 237, and *Ent. Mo. Mag.*, 1901, p. 130). Our German *confrères* are evidently behind the times in their knowledge of the literature relating to the lepidoptera.—ED.

darker than the Ticino specimens. While the Ticino examples have a nearly unbroken red band of spots in the cells 2-6, with large black pupils, those of Pontresina have only three very small red-brown spots in cells 4-6, separated and reduced by the dark veins which traverse them, and the black pupils are much diminished in size, especially in the male, the uppermost is always the smallest and generally very indistinct. In the male, the red spots in cells 2 and 3 are very slightly marked, and, in one case, only the lower one is very minutely pupilled, but, in the female, both these spots are larger and both pupilled. In the case of one female a small red-brown point is visible also in cell 1*b*. *Hindwings:* With four considerably smaller separated black spots (smaller than type, or smaller than the primaries ?) ringed red, slightly in the male, more decidedly in the female. The unpupilled costal spot is only faintly visible in both male and female. In the male the spots themselves are very faint. *The underside:* In the male the yellow-brown band of the primaries is considerably narrower, on which the five spots are very small, especially the first and the last but one. The forewings of the female are entirely brown with a grey margin. The marginal band may be either yellowish-brown and conspicuous, or little distinguishable from the ground-colour, it is a little wider, and the four black pupils are more strongly marked than in the male. The hindwings are blackish-brown in the male, grey-brown in the female, with distinct light veins. In the males, the veins are less pronounced. The band of the hindwings, yellow or yellowish-white, is narrower, or not so strongly indented on the inner edge as in the type, and the six black pupils are much smaller, especially in the male."

Herr Bartel also thinks that, on an average, the species emerges a little latter in the Engadine than in Canton Ticino. He also quotes Wheeler's list of captures and localities with his remarks on the direction of variation in this species.

Herr Bartel's claim for var. *thiemei* to rank as a local form and new variety, seems to be based chiefly on the greatly reduced size of the red patches, and on the smaller black spots of his Engadine specimens. But is it not probable that a wider acquaintance with this insect, both in its Ticino haunts, and possibly elsewhere, will shew this is hasty conclusion ? Indeed, Mr. Elwes appears to describe the Campolungo specimens as more in agreement with the so-called var. *thiemei*, than with a type as indicated by Herr Bartel. He says (*Trans. Ent. Soc. of Lond.*, 1898, p. 186): "*E. flavofasciata* is distinguished from *E. melampus*, and from all other species, by a well-defined yellowish band on the underside of the hindwing, in which five dark spots appear. On the forewing below there are four similar spots, placed in a narrower darker band which, towards the hindwing, *becomes merged in the ground-colour of the wing*. On the upperside the *bands are nearly, or quite, obsolete*, well marked *only towards the apex* of the forewing. The *spots above* are, in *some* specimens, *more* or *less obsolete*, especially on the hindwing." The italics are mine. Wheeler's observation "this sp., the smallest *Erebia*," does not harmonise with my limited experience, for of my three males the measurements are 32mm., 34mm. and 35mm. respectively.

Work done among the plume moths in 1904—with indications of observations required in 1905.

By J. W. TUTT, F.E.S.

The first important step towards getting an useful knowledge of any group of insects is to know what you want to know. With this step overcome, the rest of the work is comparatively easy. It was our idea some twelve months ago to get a good general knowledge of the British plume moths, and, with the aid of a few keen workers in the field (of whom we must specially mention Mr. Bankes and Mr. Ovenden), and Dr. Chapman and Mr. Bacot working on the material after its collection, a tremendous amount of advance has been made, and the actual details of importance, of which we have to confess absolute ignorance, have been reduced to comparatively small limits. If, however, British lepidopterists do not know these details, we are in a position to assert that continental lepidopterists appear to be in an equally unsatisfactory position. To complete one or two particulars, however, we shall have to beg the aid of continental lepidopterists, since these details have to be obtained from species we either do not get in Britain (*e.g.*, *Hellinsia distinctus* and *H. scarodactyla*) at all, or from species that are so local that only by the special effort of a particular individual can we hope to clear up our own difficulties without outside help (*e.g.*, *Fredericina tesseradactyla*).

Summarising the main points about which information is still wanted, we may note the following :—

(1) The egglaying habit of *Eucnaemidophorus rhododactyla* : the length of its egg-stage ; the habit of the larva between the time of hatching until it hybernates ; the mode of hybernation.

(2) The same details with regard to *Capperia* (*Oxyptilus*) *heterodactyla* (*teucrii*).

(3) Details of the whole life-history of *Fredericina tesseradactyla* ; living ♀s with the foodplant ; larvæ in any stage ; pupæ in any stage, etc., are desired. No satisfactory life-history of this species has yet been published, and as only the Hon. C. Dillon and Mr. Kane know the habits of this species in its Irish localities, unless these lepidopterists can get us material we shall have to beg living specimens from our continental confrères.

(4) No move has been made during 1904 as to *Amblyptilia punctidactyla*. Not one of our friends has been able to get it in any stage, for study, although *A. acanthodactyla* came from two or three different localities.

(5) What becomes of the larva of *Marasmarcha lunaedactyla* (*phaeodactyla*) from the time it leaves the egg, in July, until it reappears again in May the following year ? At present no one knows.

(6) Our ignorance of *Oxyptilus parvidactyla*, *O. distans*, and *O. pilosellae* is most profound. It is remarkable that not one entomologist among those who hunt the imagines of these species can tell us anything of importance about their early stages for certain. The larva of the first named is reputed to feed on *Thymus serpyllum* (probably wrong), and *Hieracium umbellatum*, and one or two other *Hieracii* species (probably right), but we do not know a single British lepidopterist who can find the larvæ. Of *O. distans* larva, Mr. Durrant has a doubtful description from a Thetford capture, whilst Mr. Norgate has found the larvæ (and sent us the empty pupa-cases from which he bred

imagines) on *Crepis virens*, but the Breck workers cannot get it again, and Mr. Norgate did not describe his larvæ. It is remarkable that the Dover and Folkestone collectors have never been able to get eggs, larvæ, or pupæ of *O. pilosellae* or *O. distans*, although in some years they have captured the imagines in dozens. Among the continental *Oxyptili* we want *O. hieracii* in any of its early stages. In fact, we could do with any species except *Capperia heterodactyla* (*teucrii*).

(7) *Stenoptilia zophodactylus* should lay autumnal eggs on the young rosettes of the seedlings of the season of *Erythraea centaurium*. Does it? If so, where do the young larvæ pass the winter?

(8) Our knowledge of the evolution of the Leioptilids is almost as unsatisfactory as that of the Oxyptilids. At one end are *Leioptilus tephradactyla* and *Ovendenia septodactyla* (*lienigianus*), at the other *Adaina microdactyla*. These are pretty well known. Between these are *Hellinsia osteodactylus*, *H. distinctus*, and *H. scarodactyla*, of which *H. osteodactylus* alone is British. This is considered a common species in many places, yet our request for the insect in its early stages has remained for twelve months almost without result; Mr. Purdey did get eggs which hatched, but the young larvæ in Mr. Bacot's hands at once disappeared; so that of this insect we still particularly want living ♀s and eggs, as the first larval stages are the most important items in working out its relationship to its allies. For the other two species we shall have to beg the aid of our continental friends. *H. distinctus* abounds in the *Gnaphalium* growing by the roadside, about 50 yards below the village of La Grave, in the Dauphiny Alps, and is the only continental locality we know; we wonder if any lepidopterist will be in the neighbourhood in June or July, 1905, for larvæ (the imagines are out in the first week of August), and we know no locality for *H. scarodactyla*.

Among the most successful work done last year must be noticed:—(1) The discovery of the foodplant and obtaining eggs and larvæ of *Buckleria paludum* by Mr. Bankes. (2) The obtaining of eggs and rearing the larvæ (to hybernating stage) of *Pselnophorus brachydactyla* by Mr. Sich. (3) The collection of an abundance of the little-known larvæ of *Merrifieldia tridactyla* (*tetradactyla*) (and to a less extent of *Wheeleria niveidactyla* (*baliodactyla*) by Messrs. Bankes and Ovenden. (4) The discovery of the hybernating stage of *Oidaematophorus lithodactyla* by Dr. Chapman. (5) The differentiation of the extreme Leioptilids (as represented by *Adaina microdactyla* on the one hand, and *Leioptilus tephradactyla* on the other), not only into different genera, but possibly into different tribes. (6) The discovery of the hybernating habit of *Stenoptilia pterodactyla* (*fuscus*) by Dr. Chapman. (7) The differentiation of the Oxyptilids into at least two groups, the smooth group represented by *Oxyptilus hieracii* and the hairy group *Capperia heterodactyla* (*teucrii*), by Dr. Chapman. (8) The discovery of the hitherto unknown larva of *Fredericina calodactyla* (*zetterstedtii*) when collecting larvæ of *Adkinia bipunctidactyla* and *Leioptilus tephradactyla*. A great many other important discoveries have been made, but they possibly bear a little less on the actual forward movement of our working out the biological history of the group than those just noted. We trust that some of our lepidopterists will be able to solve most of the puzzles indicated above, and make as great an increase in our knowledge in 1905 as was made in 1904.

Remarks on Mr. Newbery's final Article on some Doubtful or very Rare British Coleoptera.

By (Prof.) T. HUDSON BEARE, B.Sc., F.E.S., and
H. DONISTHORPE, F.Z.S., F.E.S.

(*Concluded from p. 22.*)

Trogophloeus subtilis, Er.—The specimens of *Trogophloeus tenellus*, some twelve in number, and *Trogophloeus subtilis*, Er., two in number, in the Power collections are all the same species, and are probably, as Canon Fowler says in his *British Coleoptera*, *Trogophloeus subtilis*, and we presume there is no doubt that the record is an accurate one.

Bledius femoralis, Gyll.—We must protest against Mr. Newbery's statement that *Bledius femoralis* has recently been reinstated; it has been recaptured, but not reinstated. The original specimens of Mr. Waterhouse are still in existence, and are undoubtedly this species, and, therefore, the species has been in our catalogue on undoubted evidence right up to the present time ever since its introduction.

Scymnus lividus, Bold.—This insect was taken by Mr. Bold, at Hartley, in Northumberland, and was described by him; also stated by Canon Fowler to have been taken by Mr. J. J. Walker, at Plymouth. It appears to have too definite a record to justify us in placing it in the doubtful list.

Meligethes bidentatus, Bris. We might point out with regard to *Meligethes bidentatus* that Crotch's two specimens, upon which the species was introduced into the British list, were determined by Brisout, who was then working at that group of coleoptera. On applying to Dr. Sharp, in order to determine whether Crotch's specimens were males or females, when a re-examination of the specimens would at once have settled this question, we regret to hear that at the time of Mr. Crotch's departure, his specimens of *Meligethes* and *Anisotoma* were sent to some one for the purpose of study; this person never returned them, and they have never been retraced, so that Crotch's collection is now a blank as regards those two genera, and we are afraid, therefore, that the question must remain unsettled; in the meantime, we see no reason to reject the original record.

Corticaria obscura, Bris.—This insect has been recorded from several localities, and by authorities like the late Mr. Rye, the late Dr. Power, and by Mr. Champion, and the specimens in the Power collection appear to be correctly named, and it would therefore have been presumptuous for us to have altered the record of this in the catalogue.

Silvanus bidentatus, F.—The same remarks apply to *Silvanus bidentatus*. There are records for several localities, perfectly authentic, and Dr. Sharp is the authority for Mr. Young's specimen of this species (see *Ent. Mo. Mag.*, 1866, p. 181); it would have been impossible for us, therefore, under these circumstances to have cast doubt upon these records by transferring the species to the doubtful list.

Athous subfuscus, Mull.—Surely the record of the species having been taken in the Orkney and Shetland Islands is quite sufficient justification for the appearance of this insect in the *British Catalogue*; those islands are always treated for faunistic purposes as part of the

British Isles, and we do not see that Mr. Newbery has any justification for his statement that the specimen taken in Wales, at Llangollen, was some other species. What evidence has Mr. Newbery for this statement?

Hypera elongata, Pk.—It may be pointed out in regard to *Hypera elongata*, that not only did one of us record it (*Ent. Record*, vol. xii., p. 334), but it was exhibited at the Entomological Society, and was carefully compared by the museum authorities with an authentic European specimen of this species, and it was taken under conditions which make the supposition of its being an introduced species absolutely impossible.

Thryogenes scirrhosus, Gyll.—Why does Mr. Newbery say that the localities, or most of them, given by Canon Fowler for *Thryogenes scirrhosus* apply to another species? Mr. Bennett, and both of us with him, have taken the species fairly commonly at the Pevensey marshes, and, therefore, we are by no means agreed that the species is exceedingly rare; it is perfectly distinct, and when the genuine species is obtained there can be no confusion between it and the allied species.

Dorytomus affinis, Pk.—Our authority for this species is Mr. Walton (*Ann. & Mag. Nat. Hist.*, 1844), who gives a full description of the insect, and a statement as to its differences from allied species; the record, therefore, of its capture is trustworthy, and as it was introduced by a man like Walton, whose speciality was the Curculionidæ, it would have been absurd for us to have rejected it, and we fail to see that Mr. Newbery's statement that he cannot find a trustworthy record has any justification.

Anthonomus conspersus, Desb.—The record for this species appears to us conclusive as to its being distinct from its allies, and it must be retained, at any rate for the present, until there is more definite evidence upon the point.

Anthonomus britannus, Desb.—This appears to us to rest on too doubtful evidence to justify its retention in the catalogue.

Rhyncolus gracilis, Rosen.—Surely the fact that Mr. Blatch recorded *Rhyncolus gracilis*, settled without doubt that it is a British species, and, therefore, we fail to see that it was necessary to wait until Mr. Willoughby Ellis had retaken it, before we could safely include it in the catalogue.

Ceuthorhynchidius pulvinatus, Gyll.—As regards the two species *Ceuthorhynchidius pulvinatus* and *C. pyrrhorhynchus*, there is a specimen of the former in the Bates' collection, taken by Blatch, which is the true *pulvinatus*: we agree with Mr. Newbery that the characters usually given for the separation of the two species are not trustworthy, but a catalogue was not the place in which to discuss a point of this character.

Polygraphus pubescens, Bach.—If Mr. Newbery has any definite and accurate information with reference to Mr. Lawson's record of the capture of *Polygraphus pubescens*, then he ought to give it; a mere statement that he has reason to think that there is some error is quite valueless in such a matter; Mr. Newbery must have some grounds for his thinking that there is an error, and these grounds should be given or else such a remark should not be made.

Cryptohypnus pulchellus, L.—This was determined by Dr. Sharp; it has not to our knowledge been retaken since, mainly, we believe,

because the district has not been worked, but a short time ago one of us, when working in that particular district of Scotland, saw a specimen captured, which appears to agree very closely with the description of *pulchellus*, and the specimen has been submitted to continental authorities, and we have no doubt that it will turn out to be *pulchellus*.

Ptinus tectus, Boield.—We did not include *Ptinus tectus* in the general body of the catalogue, because it was such a recent introduction into this country, or appeared to be, at any rate, at the time at which the catalogue was printed. Undoubtedly, this species will, like many other introduced species which become naturalised, have to be transferred to the main body of the catalogue. The introduced-species' list, in fact, exists as such under a time limit; if any species standing in this list is repeatedly and constantly taken in this country under circumstances which prove it to be breeding, then it is evident that the species has become naturalised, and it must be transferred to the general list.

Ernobius abietis, F.—Mr. Newbery seems to be unaware of the fact that a specimen of this species was taken by C. Gulliver, in the New Forest, in June, 1899, and was sent alive to the late Mr. F. Bates. This capture was recorded by one of us in the *Ent. Record*, vol. xi., p. 360, and, therefore, Mr. Newbery's suggestion that it should be placed in the doubtful list is entirely beside the mark.

Clytus arcuatus, L.—One of us, in a paper dealing with the British longicorns, published in the *Ent. Record*, vol. x., p. 264, discussed fully this question as to whether or not all the captures of *Clytus arcuatus* were to be referred to foreign timber, and it was shown that the species had been taken by the late Dr. Power at Epping Forest, and also by Messrs. C. O. and E. A. Waterhouse, in an old cherry-tree in Epping Forest, and in neither of these cases could there be any suggestion as to the species having been introduced in the pupal or larval stage in foreign timber; the original specimens from which these Epping Forest specimens descended, may have been introduced, but there is no doubt that the insect was living and breeding freely in this country, and therefore it was entitled to a place in the general list. Furthermore J. W. Bond recorded the occurence of *Clytus arcuatus* in Hainhault Forest in the *Entomological Magazine*, vol. i, p. 212, and in vol. iv, p. 222 he describes the economy of this beetle, points out that he has taken over 200 specimens this year (1886) and numbers of larvæ and pupæ. He describes the egg-laying of the ♀ s, fights of the ♂ s for the ♀ s, etc. Surely such a record as this is trustworthy and entitles any species to a place in our lists.

Salpingus ater, Pk.—There appear to be quite clear records as to the capture of *Salpingus ater*. We do not agree with Mr. Newbery that all the records must be referred to *æratus*.

Apion ryei, Blkn.—As to whether *Apion ryei* is a distinct species or a variety, must depend entirely upon the opinion one holds as to what constitutes a species and what constitutes a variety; it is a form no doubt characteristic of the Shetland Islands, and as such is entitled to specific rank if the views of most authorities on this question are adhered to.

Sitones brevicollis, Sch.—One of us has carefully examined the specimens of *Sitones brevicollis* in the Power collection, and they are very like *tibialis*, but are shorter and have a broader thorax; it is

possible they are only a variety, but at any rate they are what are called *brevicollis*, and in view of Dr. Sharp's remarks on this species, we were bound to retain it in the catalogue.

Polydrusus sericeus, Schal.—There are eight specimens of *Polydrusus sericeus* in the Bates' collection all labelled Lymington Salterns, and taken since the original record, and, therefore, again there was no necessity of waiting until Dr. Joy had recaptured the species before deciding to retain it in the catalogue.

Orchestes sparsus, Fabr.—In our answer to Mr. Newbery's former paper (*Ent. Record*, 1904, p. 290), we pointed out that though he considered the specimen in the Power collection to be small *ilicis*, M. Brisout named it *sparsus*, and, therefore, we could not reject it on a difference of opinion. Since we wrote that paper, one of us has recorded it from the New Forest (*Ent. Record*, 1904, p. 326), moreover, we consider the formerly unique British specimen in the Power collection to be the true *sparsus*, for differences, &c., see *Ent. Mo. Mag.*, 1905, p. 20.

Of course we fully recognise Mr. Newbery's desire to make the *British Catalogue* as accurate and reliable as possible, and we share equally in this desire, but we must protest against species being rejected or placed in doubtful lists simply because one coleopterist has doubts as to the authenticity of records, especially when he has not had an opportunity of personally examining the captures upon which the records are based. When a record, or several records as in most of the above cases, existed—records also by men who hold a high position in the ranks of British coleopterists—it would have been presumptuous on the part of any author publishing a catalogue to reject and refuse to acknowledge such records, unless he had undoubted evidence that the specimens upon which the records were based had all been examined and definitely proved to belong to another species.

VARIATION.

Black larvæ of Abraxas grossulariata.—Concerning Mr. Walker's note (*anteà*, xvi., p. 301) referring to *Abraxas grossulariata*, my experience in breeding from black larvæ has been most disappointing. One of the most unsatisfactory lots of black larvæ I ever bred came from an old bush growing in a densely smoky district, close to the Thames, in London, where bushes were scarce, and the race no doubt localised, and from which, this year, many hundreds of larvæ did not yield a single decent aberration.—B. W. Adkin, F.E.S., Trenoweth, Hope Park, Bromley, Kent. *October 28th*, 1904.

Macaria liturata ab. nigrofulvata, Collins.—At the meeting of the Lancashire and Cheshire Entomological Society, held October 4th, 1901, I exhibited and read a description of a melanic form of *Macaria liturata*. The official report reads: "Mr. J. Collins exhibited and described a fine melanic form of *Macaria liturata* from Delamere, for which he proposed the varietal name *nigrofulvata*." The description of the form appears not to have been sent out by the secretary, in his report, to the entomological magazines, with the result that no description of the form has been published. It may be well, therefore, to publish such description, so that no doubt may occur in the future as

to what the form really was that I exhibited. My description was as follows:—

Anterior wings fuscous-black; beyond the middle of the forewing a bright fulvous fascia or band, which extends also across the hindwings, the latter being of the same coloration as the forewings. Scales around thorax greyish. The under-surface of fore- and hindwings fulvous to the fascia.

This form occurs not uncommonly in Delamere Forest, and is disturbed by beating firs. It has also been taken at Rudheath, in Cheshire; also in North Staffordshire, in July, 1908, in a large fir-wood.—J. Collins, 10, Pierpoint Street, Warrington. *November 21st*, 1904.

SCIENTIFIC NOTES AND OBSERVATIONS.

Proportion of the sexes in broods of Lepidoptera reared from ova.—(1) 1865, *Camptogramma fluviata*—31 bred—14 ♂ and 17 ♀; 16 bred—8 ♂ and 8 ♀ (inbred). (2) 1866, *Ennomos tiliaria*—21 bred—13 ♂ and 8 ♀; 1867, 105 bred—35 ♂ and 70 ♀ (inbred). (3) 1867, *Dasychira pudibunda*—12 bred—6 ♂ and 6 ♀. (4) 1876, *Coremia munitata*—6 bred—4 ♂ and 2 ♀. (5) 1876, *Selenia illustraria*—66 bred—39 ♂ and 27 ♀; 1890, 12 bred—6 ♂ and 6 ♀. (6) 1886, *Ennomos autumnaria*—61 bred—30 ♂ and 31 ♀. (7) 1886, *Dorypha mendica*—7 bred—2 ♂ and 5 ♀; 1890, 45 bred—23 ♂ and 22 ♀. (7) 1890, *Saturnia pavonia* (*carpini*)—67 bred—43 ♂ and 24 ♀. As far as my experience goes I think the proportion of the sexes, under purely normal conditions, is about equal, but should any great struggle for existence take place the ♂ is the first to succumb. These few records from my notes are not of great value. I rarely recorded the sexes of specimens bred, which is unfortunate.—C. Fenn, F.E.S., Eversden House, Burnt Ash Hill, Lee, Kent. *December 28th*, 1904.

Protective resemblance of Moma orion.—I was fortunate enough to capture a ♀ of this rare and beautiful insect in King's wood, Maidstone, on June 20th, 1904. It was in repose on the trunk of an oak about 5 p.m. Its environment lent additional interest to the capture. Close beside it were patches of a broad species of lichen (*Parmelia caperata*), whose nature it is to lie close to the bark and whose delicate green shade is similar to the prevailing colour in *M. orion*. The plant creeps over the tree in the form of lobes, of broken and wrinkled outline, projecting themselves unevenly in all directions. Consequently, where its margins meet, intermediate spaces of shadowed bark are left visible beneath. These closely resemble the black markings on the wings and thorax of the moth. It is further noticeable on closer examinations that, whereas in the lichen the wrinkled surface causes faint lights and shades to appear in the green, in addition to which its extreme edges are tipped with a lighter shade of green than the rest, in *M. orion*, white markings, mingled with the green, produce the same delicately shaded effect. The resemblance of the insect to its surroundings was so close, that it was difficult to distinguish between them. May not this lichen, flourishing as it does especially on oak, have done something towards preserving the species of *M. orion*, especially where the latter may have been fortunate enough, on emerging at the base of the tree, to crawl up and rest beside it? I am indebted to Miss A. Lorrain Smith, of the Botanical Department of the British Museum (Nat. Hist.), for kindly naming the lichen.—George A. Crawshay, Leighton Buzzard. *November 9th*, 1904.

ORTHOPTERA.

ACRIDIUM ÆGYPTIUM IN SURREY.—I think you will be interested in hearing that a fine ♂ specimen of *Acridium aegyptium* has been brought to me this evening, and I have it alive in my study at the present moment. It was found in a cauliflower, that had been imported from the south of France, by a Godalming greengrocer. The shop people were alarmed, and called in the assistance of a cattle-drover. I suppose they thought he was accustomed to handling fierce beasts! but he fortunately took care of it and brought it to me. I see that it has not been often recorded, and so send you news of this specimen.—OSWALD H. LATTER, M.A., Charterhouse, Godalming. *December 27th*, 1904.

HEMIPTERA.

ZICRONA CÆRULEA, LINN., AN ADDITION TO THE HEMIPTERA OF THE NORTHUMBERLAND AND DURHAM DISTRICT.—On April 4th, 1904, I took a beautiful bluish-green *Hemipteron* from under a stone lying on the Moors near Blanchland. Prof. Beare kindly identified it as *Zicrona caerulea*, Linn. (Saunders *Hemiptera-Heteroptera*, p. 36), an insect of occasional occurrence in the south of England and seemingly much rarer further north.—RICHARD S. BAGNALL, F.E.S., The Groves, Winlaton-on-Tyne. *January 9th*, 1905.

GERRIS CANALIUM, DUF. = NAJAS OF AUTHORS.— Mr. G. W. Kirkaldy writing of this species in the *Entomologist* (xxxii., p. 203), says, "It is well distributed over the southern English counties; but I know of only a single record (Lincolnshire) north of the Thames, and none from Scotland or Ireland." In last September, I came across this species in considerable numbers on the canal at Marple, in Cheshire. From the statement quoted above I believed I had discovered a new locality for it, but recently found it recorded from the very same place by Benjamin Cooke in a list of Lancashire and Cheshire Hemiptera, published in the *Naturalist* for 1882.—OSCAR WHITTAKER, F.E.S., 39, Clarendon Road, Whalley Range, Manchester. *January 24th*, 1905.

NOTES ON COLLECTING, Etc.

PLATYPTILIA ACANTHODACTYLA, HB., AND COSMODACTYLA, HB., IN S. DEVON, IN 1904.—Since Dr. W. S. Riding tells us (*Ent. Rec.*, xvi., p. 295) that he failed to find any larvæ of *Platyptilia acanthodactyla* in his district of East Devon last year, it may be of interest to mention that larvæ of the second brood of this species were particularly abundant in the parts of South Devon which I worked in the autumn. Having already, during the summer, secured ovipositing females, as well as the larvæ, of this species in South Dorset, I was most anxious to obtain material for a closer study of the life-history of *P. cosmodactyla* before the publication of Mr. Tutt's forthcoming volume on the Plumes, and devoted much time, in South Devon, to searching for, and examining, Alucitid larvæ and pupæ on flower- and seed-spikes of *Stachys sylvatica* and *S. palustris*, and collected about 1500 of them, the great majority being found on the former plant, which was by far the commoner in the hedgerows. A sadly large proportion, probably not less than one-half of the larvæ, were ichneumoned, but the breeding-jars poduced 758 imagines of *P. acanthodactyla*, which appeared

September 5th-October 22nd; these varied to a limited extent in colour, but none of them approached *cosmodactyla* in general facies. Although I have not known *acanthodactyla* larvæ attempt to prey upon one another (doubtless not appreciating a hairy diet), they proved on this, as on all other occasions in my experience, fearful cannibals as regards the naked pupæ of their own species, which they greedily devoured at every opportunity, in spite of having an abundant supply of fresh food. To minimise the loss from this cause, it was found necessary to remove, each day, all the newly-formed pupæ from the jars in which the larvæ were kept. The variation in the colour of the larvæ (including that of the head *after* the final moult), and of the pupæ, of *acanthodactyla*, is most remarkable. To my great disappointment, no larvæ of *P. cosmodactyla* were found, but one spot, where *acanthodactyla* larvæ were common, yielded me, on September 3rd, a female *cosmodactyla*, and some pupæ on *Stachys sylvatica*, from which, among various *acanthodactyla*, three *cosmodactyla*, apparently all ♀s, emerged September 7th-11th. The captured *cosmodactyla*, which firmly declined to oviposit, and so to give me the chance of rearing a brood before the winter, was kept alive, and although, before hibernation, she occasionally regaled herself upon the ivy bloom in her cage, she succumbed, alas! on the very last day of the old year, by which date all the *acanthodactyla*, that I had hoped would successfully hibernate, were already dead. The moths were kept in a fireless room, facing north, and supplied with fresh ivy-bloom in the autumn. In answer to the Rev. C. D. Ash's inquiry (*Ent. Rec.*, xvi., 240) as to the probable foodplant of *P. acanthodactyla* on the moors, it seems to me quite likely that the larvæ feed there on the flowers of *Erica cinerea* and *E. tetralix*; these would, I have little doubt, be available, at any rate on our southern moors ("heaths," as they are called here), for the larvæ of both broods, though Mr. W. H. B. Fletcher thinks it possible that those of the earlier one may feed on gorse (*Ulex europæus*) bloom. *P. acanthodactyla* is well-known to be polyphagous, but, to the best of my belief, none of the many foodplants, that I have seen recorded by British and Continental authors, grow in some of the heathy spots it frequents. Perhaps Mr. Ash will search for the larvæ on the Skipwith moor in the coming season, and I will endeavour to do so here, having found last year, for the first time, a locality for it on our heath, and being anxious to place the question of the foodplant in such a spot beyond the region of mere guess-work.—EUSTACE R. BANKES, M.A., Norden, Corfe Castle. *January 21st*, 1905. (Roessler found larvæ in August on the bloom of *Calluna vulgaris*, Hering on *Vaccinium oxycoccus* and *Erica tetralix*.—Ed.)

MACROTHYLACIA RUBI, L., FEEDING ON MYRICA GALE.—To the already lengthy list of foodplants of *Macrothylacia rubi*, recorded in Mr. Tutt's *Nat. Hist. Brit. Lep.*, iii, 144, I can add *Myrica gale*, having found, last October, on the heath near here, a well-grown larva clinging to this plant, and busily engaged in devouring the leaves.—EUSTACE R. BANKES, Norden, Corfe Castle. *January 23rd*, 1905.

SYRICHTHUS MALVÆ IN APRIL.—On April 25th, 1904, I was surprised to notice, flying in the sunshine on a strip of warm undercliff on the Isle of Purbeck coast, a precocious specimen of *Syrichthus malvæ*, which, on being duly netted, proved to be a female in grand condition. This early appearance was rendered the more remarkable by the fact that

no other individual of this species was observed by me until May 25th. —IBID.

PARASITE ENTERING A BREEDING-HOUSE.—From time to time one sees theories put forward to account for the scarcity of some species of butterfly, where, perhaps it has been plentiful in former years. An experiment I made last year has shown one possible cause of temporary scarcity. I made a breeding-house 70ft. by 20ft., covered with a netting large enough for very small insects to pass through. Among other things I introduced five nests of *Aglais urticae*, in the spring, with a very good result in imagines. From this first lot larvæ were obtained in great numbers, so that the pupæ were all over the place. Only a few imagines appeared in the autumn of which I am doubtful whether any are hybernating. The great majority of the pupæ contain a number of small grubs each. By the way, I might mention that the intention of the house is to breed species which are not found in this neighbourhood and introduce them. I should be glad to hear the experiences of anyone making similar attempts, whether they be failures or successes.—E. E. BENTALL, The Towers, Heybridge, Essex. *January 23rd*, 1905.

BREEDING HYBERNIA DEFOLIARIA.—I should like to know what treatment has proved successful in breeding *Hybernia defoliaria*. I ask because I am always unsuccessful with it; I do not get 5 per cent. of moths from my larvæ, and I collect every year a good many. I give plenty of depth of soil, have varied it by keeping it moist, and sometimes dry, but always with the same result. I do not appear to get ichneumons, so conclude I never get the larvæ to pupate, although I have seen fullfed larvæ entering the soil. The moth was in great variety early in November, where I collect most of my larvæ.—S. WALKER, 15, Queen Anne's Road, York. *January 9th*, 1905.

WINTER BROOD OF CIDARIA RUSSATA.—During November and December (1904) I reared a small brood (about a dozen examples) of *Cidaria russata*, the larvæ of which I induced to feed up by giving them young strawberry leaves. For the three or four preceding years I have tried them on whitethorn, sleeving them out all the winter; but they have all disappeared by spring, so I suppose the earwigs have got them. Those bred are all very black, but not much darker than the mother.—R. B. ROBERTSON. *January 3rd*, 1905.

LEPIDOPTEROLOGICAL NOTES FROM CANNOCK CHASE FOR 1904.—A thoroughly bad season has been that of 1904. Early spring insects such as *Asphalia flavicornis* and *Brephos parthenias* were scarcer than usual, and, although *Callophrys rubi* and *Hadena glauca*, being commoner than I have seen them for some time, gave promise of better things, cold nights in June made sugar a total failure. On one night I got a few *Hadena glauca*, *H. contigua*, *H. adusta* and *Acronycta menyanthidis*, but for the rest of the season on no one night did I get more than three takeable insects. The long drought and abundance of honeydew in July and cold east winds in August being no doubt answerable. I got a few *Stilbia anomala* during the first fortnight in August, but only three *Noctua castanea*. Of this latter insect the red form invariably occurs. They are the most vinous-red forms I have seen. I have only observed one in any way approaching ab. *neglecta*, and that was taken by Mr. Woodforde when sugaring with me about five years ago. It was olive-ochreous in colour and had red fringes. It was sold with

his collection. I got also two *Cirrhoedia xerampelina* and had a much battered *Agrius convolvuli* brought to me in September. We are so far inland here that we are not much favoured by immigrants and there are very few records of its capture in this county. Autumnal larva-beating was a complete failure.—RICHARD FREER, M.D., Rugeley, Staffs. *January 15th*, 1905.

LEPIDOPTEROLOGICAL NOTE FROM THE ESTEREL AND DRAGUIGNAN.—On May 1st, 1904, I went over some old ground in the Esterel, from Agay to the Mal Infernet, &c. In this corner of the Esterel, *Euchloë euphenoides* occurs freely, and its foodplant, *Biscutella*, is seen to be fairly common. I suppose there must be some limestone about, though to appearance all is metamorphic or igneous rock. It contrasted with the absence of limestone species at St. Maxime. On May 2nd, I spent a day at St. Raphael; *Melitaea athalia* and *M. aurinia* were seen, *M. cinxia* were abundant, and *M. phoebe* and *M. didyma* not uncommon. The most interesting species seen were one *Syrichthus sidae* and one *Eurranthis pennigeraria*, rather worn. Not a trace could be found of *E. plumistraria*, so common here on a former visit; it was probably quite over. Going on to Draguignan, a pair of *Drilus flavescens* were picked up on the evening of arrival, and a Phytophagous beetle (*Adimonia*), like a *Meloe*, with a yellow line down the short elytra, was very common. Draguignan is evidently an excellent entomological centre. Larvæ of *Libythea celtis* were found here. Several *Leptidia duponcheli* were met with; *Melitaea cinxia*, *M. phoebe*, and *M. didyma* were abundant, as well as *M. aurinia* var. *provincialis*. *Colias hyale* was common, as were also *Leptidia sinapis*, *Syrichthus sao* and *Brenthis dia*, whilst *Thais medesicaste* was frequent but local. *Anthrocera lavandulae* was frequent, and *A. rhadamanthus* and other species were locally abundant.—T. A. CHAPMAN. *January 15th*, 1905.

LEPIDOPTEROLOGICAL NOTES FROM DEREHAM, NORFOLK.—During the last few days in June of last year, I paid a visit to the above locality. The weather proved very fine, but the evenings were cool and rather windy, and the only method of taking insects was by dusking. The best places were the lanes with high banks, those between woods, and some low swampy ground covered with *Iris* and rushes, and a few sallow and other bushes. Arriving on June 25th, I soon found that a fair number of things were about. *Metrocampa margaritaria* was found on the hedge banks drying its wings, and was afterwards common at dusk. A worn *Dasychira pudibunda* ♀ was sitting on some palings, while *Spilosoma lubricipeda* and *S. menthastri* were just going over. *Triaena* (*Acronycta*) *psi* was common on tree-trunks; also a specimen of *Mamestra suasa* in the same position. From June 27th to July 1st, dusking in the lanes produced *Melanippe montanata*, which was probably the most abundant insect out, and very variable, a fine dark banded form resembling *Melanthia ocellata* very closely; also *M. unangulata* (1), *M. sociata*, *Boarmia repandata* (a grey form) plentiful, *Asthena luteata* (a few), *Iodis lactearia*, *Acidalia scutulata*, *A. bisetata*, *Cidaria pyraliata*, *Melanthia albicillata*, and, during the last two nights, *Coremia quadritaeniata* (3). On the marshy ground, *Leucania impudens* and *L. impura* were common, also *Phibalapteryx vittata* (worn), and *Cabera pusaria* and *C. exanthemaria*. On the garden railings, *Thera variata*, and *Eupithecia rectangulata* were found. Butterflies were very scarce, only the three common whites and *Pamphila*

sylvanus being seen. Larvæ were not plentiful, those of *Vanessa io* and *Aglais urticae*, *Dianthoecia capsincola*, and *Cucullia verbasci* being almost the only ones seen. Of the plumes, *Alucita pentadactyla* and *Stenoptilia pterodactyla* were found in a sandy lane.—W. J. CLUTTEN, 132, Coal Clough Lane, Burnley. *January 5th*, 1905.

LEPIDOPTEROLOGICAL NOTES OF THE SEASON 1904, IN NORTH-EAST IRELAND (*concluded from* vol. xvi., p. 209).—On June 10th, I paid another visit to the gully on Slieve Gallion, but *Hadena glauca* was evidently over, and I only saw two worn specimens, but I took several *Larentia salicata* and one *Hypsipetes ruberata* flying over dwarf sallow. On June 11th, one fine male *Leiocampa dictaea* emerged, the larva was taken at Loch Fen. On the 18th, *Hadena psi* and *H. thalassina* were common at sugar in the same locality. *Dianthoecia conspersa* appeared at flowers on June 20th, and one *Plusia bractea* on the 27th. From July 6th to July 9th I was in co. Roscommon, and at Mote Park took larvæ of *Asphalia flavicornis* on birch plentifully. At home, on July 12th, two *Melanippe unangulata* were netted at dusk, also *Cleora lichenaria* and *Coremia munitata*, in fine condition. A fine female *Amphidasys betularia* emerged on July 14th, and by 'sembling I took three males, which did not appear till 1.30 a.m. *Plusia interrogationis* was first seen on the 16th, at thistles, also several *Larentia caesiata* ab. *gelata*, and one *Celaena haworthii*. Between July 25th and 30th were taken a large number of *Cidaria prunata*, which insect I was glad to get, and is an addition to the local list. On August 4th, I took a *Geometra papilionaria*, and saw several more. From August 5th to 31st I was at Portstewart, co. Antrim, and, on the 6th, on the sand-hills, *Agrotis vestigialis* and *A. tritici* were common on ragweed, but nothing else of note. On the 15th, I took a trip by cycle to the basalt cliffs, near Dowshill. On ragweed, growing on ledges at the base of the cliffs, *Agrotis lucernea* occurred sparingly, also a few *Actebia praecox* and *Polia chi*. On the 16th, I cycled to a locality near Fair Head for *Larentia flavicinctata*. The insect occurs on a steep slope of limestone, where *Saxifraga hypnoides* grows abundantly, and I got a very fair series, but the nature of the ground makes it difficult to work properly; this is at night. I searched several plants that were in reach for ova, but was unsuccessful. On the 19th, I paid a visit to the cliffs above Bellarena station. These cliffs have been worked previously, I believe, by Messrs. Curzon and Salvage, with good results. The ragweed was going over, but a fair number of *Agrotis lucernea* and *Actebia praecox* occurred, as well as a few *Stilbia anomala*. On the 23rd, cycling home, I paid a visit to a large bog for larvæ of *Leiocampa dictaeoides*, of which I did not see a sign, although an hour's search produced the following larvæ: six *Smerinthus ocellata*, four *Notodonta ziczac*, three *N. dromedarius*, *Lophopteryx camelina* abundantly, one *Dicranura furcula*, *Hadena pisi*, common, three *Demas coryli*. At sugar, in the late autumn, insects were abundant, the following occurring—*Peridroma saucia*, *P. ypsilon*, *Noctua rubi*, *Triphaena fimbria*, *Anchocelis pistacina*, *Orrhodia vaccinii*, *Scopelosoma satellitia*, *Xylina socia*, *Mellinia circellaris*, *Calocampa vetusta*, *C. exoleta* and one *Agriopis aprilina*, an insect I have never taken here before. A few *Poecilocampa populi* were noticed on the lamps in December.—T. GREER, Lissan. *January 25th*, 1905.

REVIEWS AND NOTICES OF BOOKS.

[PRACTICAL HINTS FOR THE FIELD LEPIDOPTERIST, PART III. BY J. W. TUTT, F.E.S. Price 6s. net (interleaved). Published by Elliot Stock, 62, Paternoster-row, E.C.].—The issue of the third part of this notable work completes what at its inception the author called a "little brochure," but which has now assumed the proportions of a respectable volume. Originally intended as a reprint, and orderly condensation, of the "Practical Hints" accumulated in the *Entomologist's Record and Journal of Variation*, it has been enriched by notes and suggestions from practical entomologists in all parts of the United Kingdom, until, in its complete condition, it contains a mass of precise information on the habits of lepidoptera and kindred subjects, such as has never before been presented to British or world-wide lepidopterists. From the commencement the work has taken the form of an extended Merrin's *Calendar*, blended with a reflection of those charming fore-words which have for so many years been a comfort and encouragement to readers of Stainton's *Manual*. But in these *Practical Hints* we have more than this. Beyond the quotation of standard works, such as Buckler, Hellins, and, of course, Greene, hearsay and tradition have no, or at the most the very minimum of, place. These "Hints" are written by practical collectors, who are themselves adepts as concerns the species about which they write. This would appear to us one of the strongest points about the book. The information is reliable. As the information is spread over the whole of the year, it will be seen that the work serves the double purpose of telling one the characteristics of the species and also *where* and *when* to seek it, generally in its different stages. But the author is nothing if not up-to-date, and, in Part iii. he supplies mental food not only for the simple collector, but also for the would-be scientist. It is divided into two sections, and the first of these calls for special notice and commendation as supplying a want which has been long felt among entomologists. It deals practically with "Collectors," "Collections," "The egg and egg-stage," "Larva and larval stage," "Pupa and pupal stage." The collector is usually a man of limited means and leisure, keen on his collection, and careful in his observations, but without the training which permits him to record his observations in the manner demanded by modern science (the terminology of which is often foreign to him), yet not unwilling to make his work scientific if he can. He often sees, no doubt, descriptions of eggs, larvæ, or pupæ, which he has hard work to understand. He turns up his Newman and finds that Newman's butterflies and moths were generally without eggs or pupæ, and that the larvæ are described without any note of the essential structural features, which point out its close relationship with other species, and he possibly cannot afford Buckler's *Larvæ*, an expensive work so far as the letterpress is concerned, but cheap enough when the beautiful figures are taken into consideration; but even this is not modern or up-to-date, and is only, after all, a stepping stone to modern work. The fact of the matter is, that there are men hard at work, who are, at the present time, making modern scientific entomology. Bacot and Dyar have, as it were, constructed the scheme upon which larval work is done, and Chapman and Poulton have done the same for pupal

work. They and their co-workers have had to create a terminology with which to explain and record their facts. The older lepidopterists, who have worked side by side with them, have been able to keep up, if so they wished. But for those who have not kept up, have fallen behind, or wish to begin the study, there is an urgent need for information which may translate what has become, or is, an unknown language to them. Both the old collector and the beginner ask for a guide-book, which shall be simple enough to put them on the right track, and yet precise enough to explain to them, if they be of a mind to learn, what present-day workers have to tell them about the inner secrets of their study. It is just this which Part iii supplies. The seven plates accompanying the text will enable the student to compare the real objects with the descriptions, to understand the modern descriptions of ovum, larva, and pupa, and enable him to describe these stages in language which will be definite and understandable. If any defence of this point be necessary, one has only to turn for support to the memorable words of H. T. Stainton in his *Manual*, vol. i., p. 70, where, after urging the careful study of all the stages of the butterflies which he has been describing, and putting 18 questions as to their life-history, he concludes: "When these questions can be answered with reference to each species of our butterflies, we may then admit that their natural history *is* known, and it would then be practicable to write a good monograph of the whole." The second section is of the same nature as Parts i and ii, consisting of some 1200 hints, arranged in their proper superfamilies, and placed under the month during which the species occur. It is noticeable that certain superfamilies, which were not so fully noted in the former parts, are here dealt with at length. Amongst others are noticed the Eriocraniides, Crambides, Pyralides, Geometrides, Anthrocerides, Ægeriides, Deltoides, Notodontides, Noctuides, Lithosiides, Hesperiides, and Papilionides. These are all very fully treated, and comprise possibly two-thirds of the hints in this final part, those on the Geometrids, Noctuids and butterflies being particularly extensive. A word of praise is especially due to the beautiful photographs of eggs, illustrating those of the various superfamilies, while the explanatory details of Mr. Bacot's and Dr. Chapman's diagrams of larvæ and pupæ form a little text-book in themselves, the pupal details being especially clear and easy to follow. Finally we come to the indexes, thanks for which are due to Mr. Turner, which will make the contents of all these parts get-at-able, as they could not be without their aid. They comprise a "general" and a "specific" index. From the latter we find that some 1600 of the 2100 British species of lepidoptera are dealt with in the work in some stage or other. The number of hints devoted to individual species varies, we find, from one to twenty-six, the latter in the case of *Dimorpha versicolora*. We heartily congratulate the author upon the completion of his very useful volume, and feel sure that his original wish, that the book would help many collectors to make scientific use of their study, will be amply fulfilled. We must not neglect to say that the author has erred on the right side, if at all, in persuading Mr. Tonge to contribute so luminous, yet simple, a chapter on the ways and methods of photographing eggs for reproduction. This will, no doubt, bring many recruits into the field. Two of the plates are reproduced for this number to illustrate some of the points to which reference has been made.—C. R. N. B.

CURRENT NOTES.

In vol. xv., p. 246, we noted some remarkable statements made by Mr. F. Littler in the *Entomologist*, concerning the economy of a Tasmanian Psychid, *Entometa ignobilis*. In the current number of the *Entomologist*, p. 310, Mr. Littler extends his observations to another Psychid, *Clania lewinii*, and some of his notes on this are as remarkable in their way as were the previous ones on the other species. Mr. Littler's general remarks on the ignorance of lepidopterists as to the Psychid economy remind us much of the tale of the ostrich that hid its head in the sand and fancied its pursuers could not see it. Mr. Littler evidently knows nothing of the literature of the Psychids, and hence thinks there is none. The editor of the *Entomologist* has been wise in submitting this paper to Dr. Chapman, so that some of the doubtful points may be raised with their publication.

A note that wants the attention of British lepidopterists is published by Herr Slevogt (*Soc. Ent.*, p. 124). It relates to a supposed new European species allied to *Arsilonche alborenosa*. Herr Slevogt also uses a note relating to Dr. Chapman's paper on the variation of *Chrysophanus phlaeas* (*anteà*, xvi., p. 167), that appeared in a recent copy of the *Insekten Borse*, as a hook on which to hang a further interesting note on the subject from his own particular point of view in Bathen (*Ins. Borse*, p. 179).

Dr. J. H. Wood adds (*Ent. Mo. Mag.*) two Diptera to the British list; one, if not *Callimyia elegantula*, Fall., is new to science, the other is *Agathomyia borella*, Zett. The first-named were taken at Coldborough Park, May 23rd, 1904, and at the foot of the Black Mountains, opposite Longtown, on June 24th, 1904; the last named at Shobdon marsh near Pembridge, in the valley of the Arrow, between July 9th and August 18th, 1904. Herefordshire seems remarkably well off for the Platypezids.

At the last meeting of the Entomological Club, held on January 17th, 1905, at the Holborn Restaurant, Mr. G. H. Verrall being the host, supper was served at 8.30 p.m., in the Entomological Salon. Almost a hundred members and friends were present, and, as usual, a most enjoyable evening was spent. The members present were Messrs. Adkin, Chitty, Donisthorpe, Hall, Porritt, Verrall, and Professor Poulton; whilst the friends included, amongst others, Messrs. Arrow, Austen, Andrews, Adams, Borrer, Bryden, Burr, Boyd, Bouskell, H. Rowland Brown, Cameron, Cant, Carrington, F. Noad Clark, Champion, Carpenter, Collin, Distant, H. Druce, S. Edwards, H. W. Ellis, Frohawk, Fenn, Goss, Gahan, Geldart, Hanbury, Heron, A. Harrison, Jacoby, Janson, Jenner, Jennings, Kirby, Kaye, Lucas, Lewis, Lloyd, Morley, Martineau, Merrifield, Main, South, W. Sharp, Sich, Skinner, E. A. Smith, Tutt, Tatham, Turner, Vice, E. A. Waterhouse, C. Waterhouse, Wainwright, Commander Walker, Lieut. Col. Bingham, Col. Yerbury, Col. Swinhoe, Drs. Chapman, Dixey, Joy, Professors T. H. Beare, Meldola, Reys, E. A. Eaton, H. C. Lang, F. Morice, C. Thornewill, &c. The "Entomological Club" was proposed by Mr. Verrall, "The Host" by Professor E. B. Poulton, whilst Mr. Jacoby on the violin and Mr. H. Rowland Brown with a song, contributed much to the enjoyment of the evening. An exceedingly happy and enjoyable evening when many old friendships were renewed and new ones cemented.

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The South London Entomological and Natural History Society, Hibernia Chambers, London Bridge.—The second and fourth Thursdays in each month, at 8 p.m. February 23rd, March 9th.

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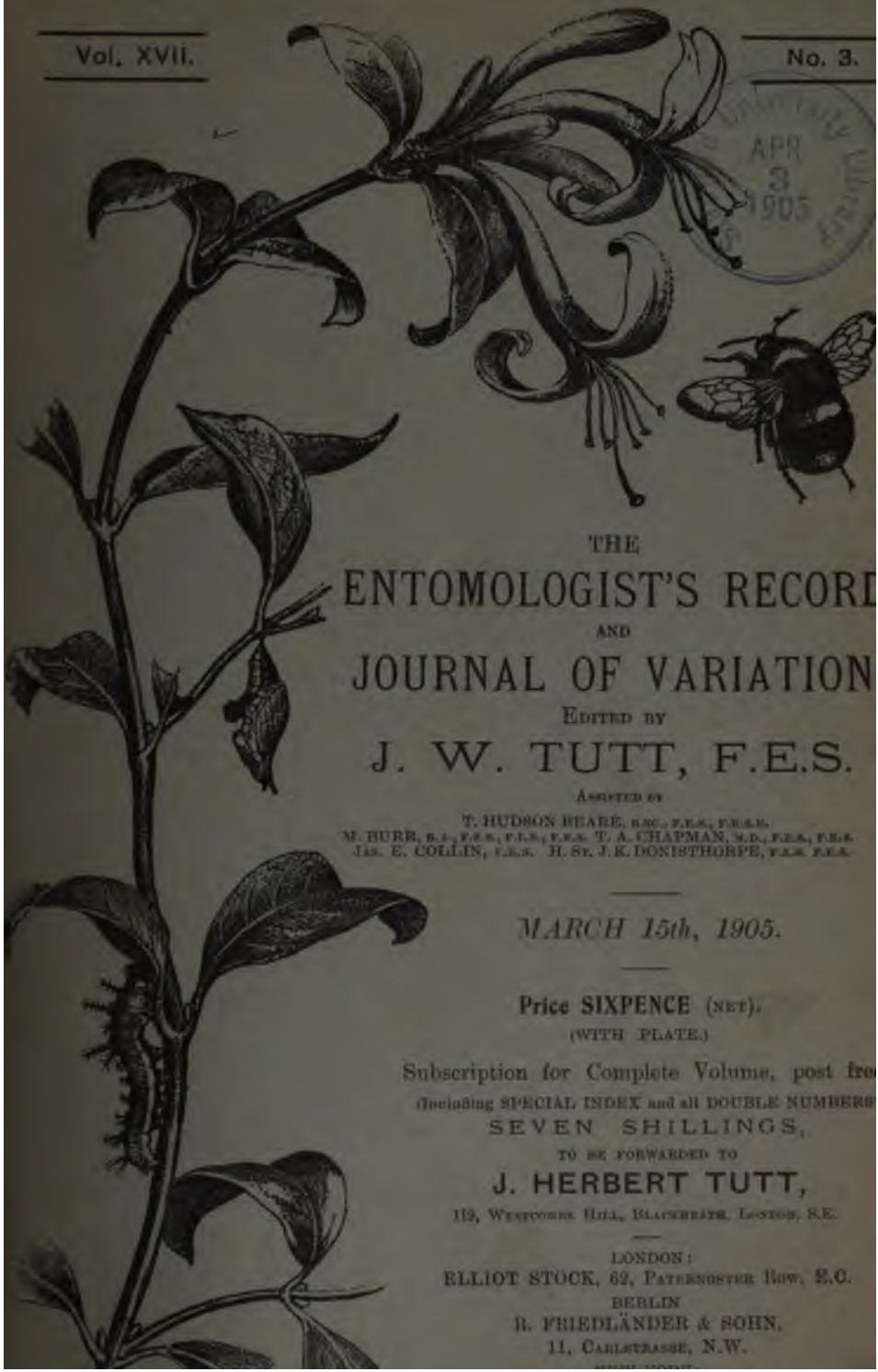

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Entom. Rec., etc., 1905. The Guil valley from above Chateau Queyras, looking south.

Retrospect of a Dipterist for 1904.

By JAS. E. COLLIN, F.E.S.

The most noteworthy addition to the recorded species of British diptera during the past year is that of *Callicera yerburyi*, Verr., a species new to science found by Col. Yerbury at Nethy Bridge in Invernessshire, the discovery of such a large and handsome Syrphid is the more remarkable when it is considered that the *Syrphidae*, by reason of their size and showy appearance, have been more widely collected, and are consequently better known, than any other family of the diptera. Mr. C. G. Lamb is responsible for another addition of special interest, *viz.*, that of *Ochthera mantispa*, Lw., a Mediterranean Ephydrid taken near Padstow, and he also records the capture of *Periscelis annulata*, Fln., in the New Forest and at Cambridge (*Ent. Mo. Mag.*).

Mr. Verrall has published a "List of the British *Dolichopodidae*" (*Ent. Mo. Mag.*) adding one genus and seven species to the old list, *viz.*, *Chrysotus monochaetus*, Kow., *Dolichopus andalusiacus*, Strobl. (previously standing in our list under the MS. name of *D. scottii*), *D. laticola*, Verr., new to science; *Hydrophorus rufibarbis*, Gerst., only previously known from one male taken near Stettin, and one female taken near Berlin; *Porphyrops patula*, Radd., *Sympycnus spiculatus*, Gerst., and *Systenus adpropinquans*, Lw. The Rev. E. N. Bloomfield has recorded *Chyliza vittata*, Mg., *Dilophus ternatus*, Lw., and *Tanypeza longimana*, Fln., as occurring in this country, and Mr. F. Jenkinson the capture of the third known species of *Asteia*, *viz.*, *A. elegantula*, Ztt. (*Ent. Mo. Mag.*).

The Rev. A. E. Eaton, in commencing a "Revision of the genera of the *Psychodidae*" (*Ent. Mo. Mag.*), has indicated five genera and two species new to science and Britain. The present writer has contributed (*Ent. Mo. Mag.*) a "Revised list of the British *Cecidomyidae*," adding fifteen new specific names, and bringing their arrangement in line with that of European lists, and, at a meeting of the Entomological Society of London, on May 4th, exhibited specimens of *Corethra obscuripes*, v. d. Wulp, a Culicid new to Britain, while at the same meeting Mr. Verrall exhibited specimens of *Neoitamus cothurnatus*, Mg., an addition to the British *Asilidae* taken near Oxford.

Mr. P. H. Grimshaw has recorded *Sciara rufiventris*, Mcq., from Saline, Fife; *Oncomyia sundewalli*, Ztt., from near Oban, and *Hydrotaea pilipes*, Stein, from Aberfoyle (*Ann. Scot. Nat. Hist.*); while Mr. Evans published the capture of a specimen of *Sapromyza affinis*, Ztt., from Newpark, Midlothian (*Ann. Scot. Nat. Hist.*).

On the Continent, Becker's "Monograph of the Palæarctic species of *Lispa*" (*Zeitschr. f. Ent.*) and Czerny's "Monograph of the *Helomyzidae*" (*Wien. Ent. Zeit.*), probably form the two most important descriptive works. In addition, Czerny has published papers on the genus *Agathomyia* and on the *Ochthiphilinae* (*Wien. Ent. Zeit.*), and Becker an article on the genus *Pelethophila* (*Zeitschr. Hym. u. Dipt.*), which latter genus has also been dealt with by Bezzi (*Att. Soc. Ital. Sc. Nat.*).

Wahlgren has given some interesting notes upon the types of Zetterstedt's *Nemocera* (*Arkiv f. Zool.*). Villeneuve contributes towards a "Catalogue of the Diptera of France" (*La Feuille*). An

important work upon "Amber diptera" of the families *Cecidomyidae* —*Chironomidae*—has been issued by Meunier, a well-known authority upon the subject (*Bruxelles*, 264 pp., 16 pls.), and a minor article upon the *Syrphidae* in amber, by the same author (*Jahrb. Preuss. Geol. Landesanst.*). The Aphaniptera or Fleas have been dealt with at considerable length by such writers as Wahlgren (*Arkiv f. Zool., Ent. Tidskr.*); Wagner (*Rev. Russe d'Ent.*); and Rothschild (*Novit. Zool., etc.*), and contributions towards our knowledge of the *Hippoboscidae* are given by Speiser (*Zeitschr. Hym. u. Dipt.*).

American dipterologists have been largely interested in the *Culicidae*, and many minor publications upon that family have appeared. The chief descriptive works upon other groups have been Baker's "Revision of the Siphonaptera or fleas" (*Proc. U. S. Nat. Mus.*), and Brues' "Monograph of the *Phoridae*" (*Trans. Am. Ent. Soc.*, Dec. 1903). It is to be regretted that several American students are content to publish short articles containing miserably inadequate descriptions of species in difficult groups, thereby raising stumbling-blocks in the way, rather than assisting the progress, of the science in which they are supposed to be interested. Austen has published a *Revised Synopsis of the Tsetse Flies*, and Miss Ricardo "Notes on the smaller genera of the *Tabaninae*" (*Ann. Mag. Nat. Hist.*). Theobald has published the descriptions of several new *Culicidae* (*Entomologist*), and was the author of the article on *Culicidae* in Wytsman's *Genera Insectorum*. The third part of Baron Osten-Sacken's *Record of my life work in Entomology*, containing a list of his entomological publications from 1854-1904, has also appeared during the past year. Bishof has described new species of the *Muscaria schizometopa* (*Verh. Ges. Wien*), and Bezzi has published an important paper on Indo-Australasian *Empididae* (*Ann. Mus. Nat. Hungarici*).

Holmgren's "Zur Morphologie des Insektenkopfes," I. (*Zeitschr. Wiss. Zool.*), and Meijere's "Beiträge zur Kenntniss der Biologie und der systematischen Verwandtschaft der Conopiden" are among the more important contributions upon this branch of the subject.

In conclusion it cannot be said that dipterologists have been idle during the past year, though probably the amount of work published is rather below than above the average.

Lepidopterological notes from the Beyrout district.

By PHILIP P. GRAVES.

In July, 1904, being anxious for a short change from the damp heat of Alexandria, I paid a visit to the Lebanon, and was able to do a fair amount of collecting between July 7th and August 3rd. Of course I was rather late, much of the country had been burnt yellow and the grassland was eaten bare by goats, but, none the less, I took or saw some 60 species, and acquired some useful knowledge of where to look for butterflies, which will, I hope, be of value to myself, and, perhaps, to other collectors in the coming years. My first collecting trips, on July 7th and 8th, were directed to the mouth of the Dog River (Nahr el Kelb), about 70 minutes by train from Beyrout. Arrived there before 9 a.m. on the 7th, I began by exploring the rocks at the entrance. A few *Syrichthus orbifer* and *Carcharodus alceae*, approaching var. *australis*, with worn *Polyommatus icarus* and ragged *Chrysophanus*

thersamon were the first butterflies I saw, but, on crossing the old stone bridge, a path hedged in by willows and brambles and overhung by cliffs and steep slopes covered with bushes and dripping with water, gave me good sport. One of the first of my captures was *Syrichthus tessellum* var. *nomas*, a very fine "skipper" indeed; a worn *Parnara mathias* did not differ from Egyptian specimens; *Pieris rapae*, *Pontia daplidice* and *Colias edusa*, were the common Pierids, and a few ♀ s of *Leptidia sinapis* g.a. *diniensis* were taken. A little further on, a path zigzagging up a hillside covered with aromatic plants, mint, thyme, basil, etc., and dotted with little clumps of scrub oak and buckthorn, gave me *Gonepteryx* var. *taurica*, more *C. alceae* and *Syrichthus orbifer*, and numerous *Chilades trochilus* and *Ephthima asterope*. Most individuals of the last two species were worn. On the wing, *E. asterope* looks like our *Enodia hyperanthus*, but its flight is weak, low and sinuous, and I have seen it indulge in the *jurtina* trick of turning on its side when settling on the ground. On returning from the exploration of the slopes I took a worn *Cyaniris argiolus* ♂ near the river, and saw several *Polygonia egea*, one of which I took. It was apparently one of the early summer brood with a very light underside, and I may say that all others taken up to 5000ft. showed this form. A single battered ♀ of *Limenitis camilla* showed that the species occurred in the valley. *Pararge maera* var. *orientalis* and some battered *P. megaera* were the only Satyrids with *E. asterope*. One *Chrysophanus* var. *eleus* and some battered *C. thersamon* var. *omphale* were the only other insects I took on the 7th, but, on the 8th, I worked the roadside and quarries between Dbaych and the river mouth. Everything was burnt and withered there, prickly plants abounded, and, in consequence, the *C. thersamon*, *E. asterope*, and *Pontia daplidice* I took were mostly tattered. *Melitaea trivia* was, however, in good condition, and I got a short series, and, on steep banks covered with *Capparis*, *Idmais* (*Teracolus*) *fausta* flew at a wild speed. The heat was very trying, but I took several specimens of this lovely butterfly and noted solitary and uncatchable *Papilio machaon* and *Danais chrysippus*. The latter was flying in some numbers in the cultivated delta of the Nahr el Beyrout.

On the 9th I went up to some promising looking plantations at Daqueni some 800ft. up and about 3 miles north of Beyrout. Here I drew blank, but, below these disappointing woods, I took, on a bit of common, sparsely wooded, two specimens of a small form of *Melitaea phoebe* and a worn ♀ of *Cigaritis acamas*. *C. thersamon* occurred here, and, in a hedge, I saw trees of "fitneh," or some acacia like it, the pods of which bore traces of larval depredations. Wondering whether *Hypolycaena livia* occurred in Syria, I watched the bushes round which two or three Lycænids were flying, and, after a while, took two rather worn *Lampides jesous* (♂ and ♀). Other specimens were so worn as to be not worth killing, but I remained for some time to see if I could detect oviposition, but without success. On my way back to Beyrout I saw *Papilio machaon* and *Lampides boeticus* in gardens with more *Pontia daplidice* and *Idmais fausta*.

Swiss field-work in 1904, with notes on some noteworthy variations in Lepidoptera.

By P. A. H. MUSCHAMP.

This year (1904) has been a remarkable one for the Swiss lepidopterist, a season to be remembered for many a year to come. Never in the

memory of the proverbial oldest inhabitant has there been so advanced and so fine a spring. Rather before Easter a fortnight's handicap was given by Dame Nature to 1904, and not one hour of this fortnight has been lost by the seasons in their course. I did not thoroughly realise this till the beginning of May, when, going to hunt for young larvæ of *Apatura iris* and *A. ilia* in the Bavois woods, I found full-grown Apaturid larvæ and a few pupæ of *Limenitis populi*. "L'homme averti en vaut deux," says the proverb, and thirteen *Limenitis populi* var. *tremulae* netted in a quarter of an hour, in woods near Yverdon, a fortnight later, delighted, but by no means surprised, me, and I was quite prepared for *Apatura iole* and *A. iliades* when they made their early appearance, together with their typical descendants, for such they evidently are, *A. iris* and *A. ilia*. A short spell of bad weather and other reasons unfortunately prevented me from doing these insects proper justice at the right moment. I was, however, lucky enough to net two specimens of a form of *A. iliades*, which is, I believe, unknown to entomologists, an *A. iliades* corresponding with the perfect form of *A. iole*, the white bands absolutely unrepresented, and nothing left but the apical spots. These insects I took very late in the season, on July 4th (some days before the first appearance of *A. ilia* last year), hunting in the company of Mr. Wheeler, to whom I was introducing my wonderful Apaturid woods. It was not until I had reached home and saw the undersides of my insects that I discovered them to be not *A. iole* but *A. iliades*. It is noteworthy that, in the intermediate forms of these two beautiful insects, *A. iris* and *A. ilia*, it is sometimes the band on the lower- and sometimes the band on the upper-wing that begins to disappear. I have, for example, a specimen of *A. iole*, having for sole ornament on the forewings the exterior apical spot and one small white flake between iii. and iv_1, the bands on the hindwings being scarcely, if at all, reduced. On the other hand, a second specimen, with a fairly normal forewing, has the hindwing bands reduced to a few small dots. About *A.* ab. *clytie*, I would like to say that the insect known to commerce, *e.g.* the *clytie*, as supplied by Staudinger, does not seem to me to be the insect described by Schiffermüller and Denis, but rather a form about halfway between *clytie* and *eos*. A typical *clytie* should evidently not be more richly provided with bands of ochre than *A. ilia* itself is with white. Should it not even have less if it be as described, "transitio ad. *astasioidem*"? Now, nearly all the so-called *clytie* that I have seen here, several of them being insects supplied by Staudinger, possess a beautiful marginal band, almost, and sometimes quite, as broad as that of *eos* itself. This transitional insect is far commoner at the foot of the Jura than the narrow-banded *clytie*, and is the only "so-called *clytie*" to be found in the south of France. I do not know *clytie* from the north of France, and should be very grateful for information concerning it. As a record for Switzerland, it is worth while noting that the Bavois woods have given me one perfect specimen of ab. *metis*, and a form which is transitional between *metis* and the broad marginal-banded *clytie*, but having the eye-spot of the forewing unreduced in size.

Epinephele lycaon has given me some interesting aberrations. I have taken ♂s having a second eye-spot on forewing as in ♀ in the Val Ferret, at Trelex, at the foot of the Jura, near Geneva, and at Digne, all in July. This insect is well-known, but as yet unnamed,

and, as it is evidently very widely spread, for convenience of collectors I would suggest that it should receive the name ab. *gynoides*. The Val Ferret provided me with a number of ♀s and two ♂ *lycaon*, rejoicing in three eye-spots on forewing being placed thus: (1) ♂ between iii_1 and iii_2, iii_3 and iii_4, iv_1 and iv_2; (2) ♀ between iii_1 and iii_2, iii_3 and iv_1, iv_1 and iv_2. For this insect, one specimen of which has been noted by Mr. Wheeler in Mr. Fison's collection (*Butterflies of Switzerland*, p. 114), I propose the name ab. *wheeleri*. I have netted several transitional forms of ab. *wheeleri* in the Val Ferret, and at Naz, *e.g.*, (1) ♂ right side ab. *wheeleri*, and left side *gynoides*; (2) ♀ undersides ab. *wheeleri*, uppersides normal. Also from the Val Ferret come *E. lycaon*, ♂ having traces of light band upperside forewing, and a ♀ having light band reduced to two circular patches round eye-spots.

On September 4th, I took, at Geneva, a certain number of very undersized *Epinephele jurtina*, just out, the smallest a ♀ 31mm. only, and others, ♂s 32mm. and 33mm. (The largest I have taken this year near Geneva is a ♀ of 54mm.) Of these small specimens, one ♂ has two large unpupilled eyes, arranged in the form of an 8, surrounded by an orange ring. May not these be a second generation? Towards the end of July, in the neighbourhood of Geneva, I have taken at different times, aberrations *suffusa*, *pallens*, *semialba*, and *erymanthea*.

On the last day of July, at Naz, I took *Epinephele tithonus* ab. *excessa*. The same day I netted a beautiful aberration of *Melitaea parthenie*, which has only slight traces of two black bands on the fore- and hindwings upperside, and on the underside only the markings at base of wings remain, the hindwings being of an uniform pale primrose colour. Delighted with this catch, and burning to show it off, I waited for my companions of the net, whom I had left behind. Professor Blachier and his brother soon came up, and exhibited a similar insect, though not quite so beautiful a specimen as mine. The three of us waited for half-an-hour for the missing member of our little band, Mr. Tutt. Tired of waiting, cooked by the sun, and with a glorious thirst, we then went on to a shady grove and lunched down in a deep hollow, from the very centre of which gushed forth a delicious source of ice-cold water. Having refreshed the inner man, we went back to hunt for our companion, and at last found him near the place where we had first waited for him, massacring whole battalions of *M. parthenie*, and sublimely unconscious of the fact that he ought to be parched with thirst and half-starved. He had something to show us, however, far more interesting than the Parthenien horde, to wit, a few specimens of *Anthrocera fausta* var. *jucunda* (*genevensis*). I cannot say that these were the very first *jucunda* ever taken on the Jura mountains, for we had lately heard a report of their having been found near there, but this report lacked confirmation. The known habitat of *jucunda* is widening visibly: the Salève near Geneva, the Grisons, two or three places in the Valais, then, in 1901, I discovered it on the slopes of the Vanil Noir in the Gruyère, and now at the foot of the Jura. It is very curious to note that the type *A. fausta* is found on the Jura at Tramelan (Bernese Jura), and that these burnets are more richly coloured, and larger there than in the south of France! That the two extremes should thus so nearly meet

on similar slopes, receiving a similar provision of heat and cold, seems to require explanation. Mr. Tutt and myself took a fair number of *A. jucunda* near the top of the Saleve, on slopes facing the north, at an altitude of about 3800ft., whereas it is generally only found at the very foot of this hill, but the sunny slopes of the Vanil Noir, where I took it three years ago, are at least 1200ft. higher than the Salève.

Lepidopterists visiting the Grand St. Bernard at the end of July, or beginning of August, should take a note of the fact that *Dasydia tenebraria* var. *horridaria* was flying freely on the loose stones at the very top of the Col Fenêtre this year on July 21st, at an early morning hour and in dull chilly weather.

On August 14th, near the Chapeau, at Chamonix, among a few *Erebia tyndarus* ab. *dromus* netted, I noted an aberration with four eye-spots, the two lower ones being unpupilled and rather small. Since then I have had the pleasure of examining a number of butterflies collected by the well-known surgeon, Professor J. L. Reverdin, of Geneva. These include a very long series of *E. tyndarus* from different parts of Switzerland and the Savoy. Among the latter are several four-spotted insects and many very interesting aberrations. An examination of a considerable number of these butterflies, having more eye-spots, or spots more strongly marked on one side than on the other, shows that the right and left sides are favoured indifferently, and, consequently, that Ruhl's remarks thereupon must fall to the ground. Ruhl was probably insufficiently documented. Dr. Reverdin has picked up all the insects he could find, and, in his drawers, I remark nearly equal numbers of insects having two spots on right forewing and one on left, and *vice versa*; one spot on one side and none on the other; spots better developed on right or left side, etc. Among the curiosities is a ♀ ab. *dromus* from the Flégère, with four large pupilled eye-spots on each hindwing and only one tiny spot on the forewings. Another from the same place has a pair of magnificent black unpupilled spots on each forewing. A third, from the Gemmi, has the eye-spots in a bright red band covering half the forewing. From the Flégère come some beautiful three-spotted insects, ab. *caucasica*. The third spot placed in the cell below that which contains the second, sometimes forms a straight line with the two others, and sometimes is much closer to the border of the wing. From the Pierre-à-voir, Lautaret, and the Flégère, come specimens of *dromus* having four eye-spots to every wing. In the forewings the eye-spots occupy four successive cells, and, in the finest specimen, are all very large and white pupilled. For this beautiful insect I was about to propose the name ab. *reverdini*, but am informed by Mr. Tutt that it has already been named, from specimens captured in the Dauphiny Alps as ab. *addenda* (Ent. Rec., viii., p. 259). There are several intermediate forms, notably with the third spot missing on one or both wings. Most curious of all is an insect having five spots on the left forewing and three on the right. The fifth is an apical spot placed near the outer margin of the cell between r₂ and m₃. A second insect has this apical spot on both forewings as a third spot. Evidently there is yet another and richer insect than the described form to be found if properly looked for.

In several places near Geneva, in June, I have taken *Coenonympha arcania* ab. *obsoleta*, *C. pamphilus* ab. *bipupillata*, and an ab. of *C.*

arcania having a second large pupilled eye below apical eye (one specimen with tiny third eye-spot above normal spot), and this appears to be Mr. Tutt's ab. *bipupillata* (*Ent. Rec.*, x., p. 66). A most unexpected find in this family is a large but ragged specimen of var. (*et* ab.) *balearica*, described by myself in the *Ent. Rec.*, vol. xvi., p. 222.

Synopsis of the Orthoptera of Western Europe.

By MALCOLM BURR, B.A., F.L.S., F.Z.S., F.E.S.

(*Continued from* vol. xvii., p. 14).

Genus VIII: Omocestus, Bolivar.

This comprises the species of Brunner's group 3, of which *O. viridulus* may be taken as a typical species.

Table of Species.

1. Valves of ovipositor small, the upper valves partly hidden.
   2. Carinæ of pronotum strongly bowed in the middle of prozona, diverging posteriorly, nearly twice as far apart at the hinder margin as at the front margin.
      3. Colour greyish-red or grey. Elytra generally, especially in ♀, with a white band, entire or interrupted in the length of the scapular area. Palpi of uniform colour; hinder femora reddish-grey with dark spots; tibiæ greyish.
         4. Antennæ filiform; elytra of ♂ and generally also of ♀, with the three radial veins as usual, the 3rd diverging from the 2nd at the base; valves of ovipositor with a round tubercle on each side at base beneath.
            5. Elytra longer than abdomen in both sexes; wings as long as elytra; ♀ with the three radial veins developed.
               6. Large (♂ 12mm.-13mm., ♀ 16mm.-19mm.). Abdomen of ♂ red at apex.
                  7. Foveolæ of vertex with edges obtuse, shallow; typical sulcus approximately in middle; wings hyaline; elytra not exceeding posterior femora at rest .. .. .. 1. HÆMORRHOIDALIS, Charp.
                  7.7. Foveolæ of vertex with sharp and distinct edges; typical sulcus of pronotum in front of middle; wings smoky at apex; elytra surpassing posterior femora at rest, especially in ♀ .. .. 2. RAYMONDI, Yersin.
               6.6. Smaller (♂ 11mm.-12mm., ♀ 14mm.-17mm.); abdomen of ♂ yellow; elytra and wings about as long as posterior femora .. .. 3. PETRÆUS, Bris.

5.5. Elytra shorter than abdomen (in ♀ not surpassing half its length). Wings shorter than elytra; ♀ with 3rd radial vein of elytra fused with 2nd almost as far as apex.. .. .. 4. MINUTISSIMUS, Bol

4.4. Antennæ distinctly depressed at apex, almost as in ♀s of *Gomphocerus*; elytra of ♂ somewhat shorter than abdomen, in ♀ much shorter; in both sexes with only two radial veins; the 3rd present only exceptionally, generally represented by a branch of the 2nd, which goes off beyond middle of elytra; lower valves of ovipositor somewhat sinuous at sides, with no tubercle at base, and hardly visible when at rest. .. .. 5. UHAGONI, Bol.

3.3. Colour green and black or grey and red; elytra dark anteriorly, and green posteriorly, with a few black spots, but no white scapular band; palpi white at apex at least in ♂; femora more or less red, as also abdomen of ♂; tibiæ red in ♂ and dark in ♀ .. .. 6. RUFIPES, Zett.

2.2. Carinæ of pronotum almost straight, parallel in first part of prozona, then slightly diverging towards hinder border, where they are slightly further apart than at anterior border; colour very varied; elytra as long as, or slightly longer than abdomen .. .. 7. PANTELI, Bol.

1.1. Valves of ovipositor very long, the upper pair more or less cylindrical and exposed, the lower pair with the transverse sulcus situated before the middle, so that the apical portion is the longest; outer border with an excision which separates off a tooth more or less sharp; elytra with a very faint whitish spot, but no scapular band.

2. Elytra well developed, prolonged to extremity of abdomen, with anal area green and the rest reddish-grey; vertex slightly keeled at apex; pronotum with carinæ slightly arched in prozona, and the central keel longer in the metazona. .. .. 8. VIRIDULUS, L.

2.2. Elytra very short, in the ♀ not passing the fourth abdominal segment, entirely greyish-red. Vertex with keel; carinæ of pronotum strongly bent in and approximating in the middle, the central keel shorter in the metazona. .. .. 9. ANTIGAI, Bol.

1. OMOCESTUS HÆMORRHOIDALIS, Charpentier.

General colour pale; mouth-parts entirely pale; anal area of elytra rarely green. Length of body, 18mm. ♂, 17mm. ♀; of pronotum, 2·8mm. ♂, 3·2mm. ♀; of elytra, 10mm. ♂, 13mm. ♀.

On moors and commons in central Europe, from Mecklenberg to the Volga. It is widely distributed in France, but rare and local, occurring chiefly in east, south, and Pyrenees; recorded from Larche, Lardy, Forest of Illkirch, Bourray, Bitche, Montgueux; in Belgium it is noted from Pietershiem, and Campine; in Austria it occurs in the Tirol, at Igls, Bad Ratzes, Vill, common round Vienna, Ottakring, Mauer, Modling, Baden, Felixdorf, Steinbruck. It is fairly

common in all Spain, and recorded by Nobre from various localities in Portugal.

The variety *nebulosa*, Brunner, is larger and entirely grey in colour, marbled with paler; the elytra are wider, with pale spots and no white scapular band; the wings slightly darker; the abdomen dark brown above, whitish beneath. Length of body, 17mm. ♀; of elytra, 15mm. ♀. This variety is quoted by Brunner from Andalusia, but it is not known to Bolivar.

Var. *grisea*, Azam, is grey, speckled with brown, shorter pronotum, no white scapular stripe and somewhat smoky wings; taken by Azam at Figanières, Var.

2. Omocestus raymondi, Yersin.

This species is closely allied to the preceding but very carefully distinguished by Pantel ("Notes orth.," *An. Soc. Esp. Hist. Nat.*, xxv., 1896, p. 90). The vertex and foveolæ are more sharply defined than in that species, and the abdomen of the ♀ is red above at the apex. Length of body, 16mm. ♀; of pronotum, 3mm. ♀; of elytra 15mm. ♀.

This is a purely southern species; in France, it has been taken at Hyères, Toulon, Digne, Var, and Basses-Alpes; in Italy, at Pegli; in Portugal, at Valongo, Recarei, and in the Serra d'Estrella. Pantel (*op. cit.*) gives a number of localities in Spain, to which Bolivar adds Oña, Uclès, Cartagena, Orihuela, Barcelona, Coruña, Cordillera Carpetana, Cortijos de Malagon. It occurs also in Algeria; it is adult from May to December.

3. Omocestus petræus, Brisout.

This is a diminutive form of *O. haemorrhoidalis*; it is to be distinguished by the sharply-cut foveolæ of the vertex and the very constant longitudinal pale stripes, and absence of the general reddish colour of that species on the pronotum. Length of body, 11mm.-12mm. ♂, 14mm.-16mm. ♀; of pronotum, 2mm.-2·5mm. ♂, 2·8mm.-3mm. ♀; of elytra, 8mm.-9mm. ♂, 10mm.-12mm. ♀.

Occurs in stony places in southern Europe. In France it is rare; Lardy, Amèlie-les-Bains, Allier, Basses-Alpes, Bourray, Marseilles, Neyron on the Rhône; it has not been actually recorded in Spain, but probably occurs in the Spanish Pyrenees, as it is known on the French side. In Austria it is noted from Eichkogl, near Mödling.

It has a close superficial resemblance to the common *Gomphocerus maculatus*, Thunb., but, of course, can be at once distinguished by the non-clubbed antennæ.

4. Omocestus minutissimus, Bolivar.

This again is a diminutive form of the last species; it differs in its smaller size, abbreviated organs of flight, shorter and more obtuse pronotum. Length of body, 9mm. ♂, 12mm. ♀; of pronotum, 2·2mm. ♂, 2mm. ♀; of elytra, 5·2mm. ♂, 4·5mm. ♀.

This is a Spanish species, adult from July to December; it is noted from Escorial, Cascante, Toña, near Barcelona, Majadas, Villalba, Navacerrada, and Uclès.

5. Omocestus uhagoni, Bolivar.

Distinguished by the short elytra, unforked radial veins, long hairs on the forefeet, and somewhat clubbed antennæ. Length of body, 11mm.-12·5mm. ♂, 13mm. ♀; of pronotum, 3mm. ♂, ? ♀; of elytra, 6·5mm.-7·5mm. ♂, 4mm. ♀.

A rare species, occurring in mountains in some parts of Spain, Cascante, Navacerrada, Monton de Trigo, Navaredonda.

6. Omocestus rufipes, Zetterstedt.

Dark brown or nearly black, varied with deep red; the white apices of the palpi easily distinguish this species. Length of body, 13mm.-17mm. ♂, 18mm.-20mm. ♀; of pronotum, 2·8mm.-4mm. ♂, 4mm.-5mm. ♀; of elytra, 11mm.-15mm. ♂, 17mm.-19mm. ♀.

Found throughout Europe from Sweden to the Mediterranean; in England it is locally distributed, but found in a number of localities. It is common throughout France, and in the western and northern parts of Spain; Sierra de Gerez, Leça, Vallongo, Santander, Barcelona, Montseny, Jaca; in Portugal, also in the Foz do Douro.

In Scandinavia it is less common, but is recorded from Vadstena and Larketorp in east Gottland, Esperöd, Björnstop, and Abusa in Skane, and Finjasjon in north Skane.

In Belgium it is commoner than *O. viridulus*: Halloy, Arlon, Spa, Vieil-Salm, Chaudfontaine, Campine, Pietersheim, Rouge-Cloître. In Italy, from Vintimiglia, Pegli, Voltaggio. It occurs also in Algeria.

7. Omocestus panteli, Bolivar.

Length of body, 11mm.-14mm. ♂, 17mm.-18mm. ♀; of pronotum, 2mm.-2·8mm. ♂, 3mm.-3·35mm. ♀; of elytra, 7·5mm.-10mm. ♂, 10mm.-11·5mm. ♀.

Occurs in the fields and meadows at the feet of mountains, never ascending very high, throughout Spain. Santander, Oña, Guadarrama; also in Portugal, at Ricarei and Senhora da hora.

There is the variety *meridionalis*, Bolivar, which is larger, the carinæ of the pronotum more distinct at hinder margin, arched, the elytra and wings longer than abdomen. Length of body, 15mm.-20mm. ♂ ♀; of elytra, 11mm.-15mm. ♂ ♀.

Only recorded from Chiclana by Bolivar.

8. Omocestus viridulus, L.

The ♂ is olive, the ♀ green, varied with reddish; the elytra are of two colours in both sexes; in the ♂ the anterior part is dark, with blackish veins; in the ♀, reddish, with veins of the same colour; the hinder part is green, more olive in the ♂, and brighter in the ♀; hinder tibiæ dirty yellowish; palpi unicolorous; abdomen not red. Length of body, 13mm.-15mm. ♂, 20mm.-24mm. ♀; of pronotum, 3·5mm. ♂, 4·8mm. ♀; of elytra, 13mm. ♂, 16mm. ♀.

Common throughout northern and central Europe. It occurs in all Scandinavia, Britain, Belgium, Holland, and France, chiefly in upland grassy districts. In Spain, it is almost, if not quite, confined to the mountains, and chiefly those in the north; Oña, Picos de Europa, Nuria, Castello near Coruña, Peñalara, Monton de Trigo, La Granja, etc. In Belgium it is more local than *O. rufipes*: Halloy, Arlon, Poix, Spa, Vieil-Salm, Chaudfontaine, Pietersheim, Soigne. It extends far eastwards, in Siberia and Mongolia.

9. Omocestus antigai, Bolivar.

Characterised as shown in the table. Length of body, 17mm. ♂, 24mm. ♀; of pronotum, 4·5mm. ♂, 4mm. ♀; of elytra, 9mm. ♂, 7·5mm. ♀.

Only known from Catalonia: Monseny, Barcelona.

(To be continued.)

The Basses-Alpes and Hautes-Alpes in July (*with plate*).

By W. G. SHELDON.

It was mid-July, the brilliant blue sky was cloudless, not a breath of air stirred in the valleys, and the grilling sun was beating down as it can do, at Digne, in that month. The low levels, when there is any breeze, which there generally is, are bearable, but when this is absent they are an inferno, and the experience one undergoes until a hill is reached is no joke. However, he who wants Satyrids must put up with heat, and thirst, and all the rest of it, and a party of three—my friend Mr. P. W. Abbott, my son, and myself—sallied forth from the "Boyer Mistre," prepared for anything, provided we got the Satyrids.

Undoubtedly southern France is grand for the genus, and Digne is *the* spot. One meets with these fine butterflies in a mild sort of way in Switzerland, three or four species at the outside, but in the Basses-Alpes, I think, I am not wrong in stating, that every Satyrid species that occurs in central Europe, some ten in number, are to be found. One begins to see them as we wind up the sides of the Devouley mountains, in the train, immediately south of Grenoble, and not even the wonderful view of the Dauphiny heights, including the Pelvoux range with the peaks of Les Ecrins, and half-a-hundred others, through the left-hand window, can keep one fron craning one's neck out of the right, for that slow flying, jet black butterfly can only be *Satyrus cordula*, and the immense black and white fellow, what can it be? Surely not *S. circe*, grandest of them all, for it seems hardly likely one will meet it at an elevation of between three and four thousand feet, probably it is only the more generally distributed *S. hermione*. By the time we reached St. Auban, the big fellows have developed a kind of "barn-door" habit; *S. circe*, undoubtedly so this time, flies with its own inimitable grace, slowly about the station, settling on the tree-trunks, whilst *S. hermione* and *S. alcyone* recklessly poke their noses into the open windows of the carriages and even settle on the train, tempting us to consider the question of a hunt with Panamas. But when one gets into the valleys of the Eaux Chaudes, beyond the baths at Digne, they suddenly burst upon you in amazing profusion; one small grassy glade, fringed with wood, about the size of a tennis lawn, swarming with *S. circe*, will always dwell in memory; it reminded one of long ago, away in the seventies, when I first feasted on the sight of *Limenitis sibylla* in the New Forest; there were a dozen or more of them in a ride, flying to and fro, as *L. sibylla* alone of our native butterflies can fly. *S. circe* is, in superficial appearance, very much a white admiral, grown to the size of a big purple emperor, but with the underside a wonderful combination of cool greys, blacks, and whites; it has at least all its grace of flight, and is altogether a very glorified edition of our old friend. There must have been some two dozen of them on view at once, the males pursuing each other, the females hovering over the grass, depositing ova, and occasionally settling on the trunks of the trees that fringed the glade. A neighbouring cherry-tree, where the fruit had been left to rot, contained many dozens more, with a vast number of *S. hermione*.

We had altogether a week at Digne, and nearly every day did our collecting in the cross gorge, branching out of the Eaux Chaudes

valley, to the right, a few hundred yards beyond the baths. This is, in my opinion, the best ground at Digne during the summer months, nearly every species occurring in the district is there. Then one usually gets a nice breeze blowing down the gorge, and of charms, not the least is the fine spring of pure water at which one can drink, a boon, indeed, in this hot and thirsty land. We found here, besides *Satyrus circe*, *S. hermione*, in the lower portion; *S. alcyone*, higher up; *S. cordula*, of both sexes in great profusion everywhere; a few *S. semele*; and of *S. fidia* we got a specimen each at the entrance, and saw several others. *Papilio alexanor* flies slowly along the precipitous sides of the gorge, seldom, however, coming near enough to net, we were a little disappointed to find this fine species somewhat *passé*, but a hunt on the hillsides amongst its foodplant, *Sesile montanum*, soon disclosed plenty of larvæ, from which I have now sufficient fine pupæ to breed a series. *Parnassius apollo* was common, but, contrary to expectation, not larger than my Swiss specimens. Amongst the Lycænids—*Polyommatus meleager* was frequent, and, between us, we managed to obtain about a dozen females, 25 per cent. of which were var. *stereni*; *P. rippertii* was scarce; *Chrysophanus gordius* common, but mostly *passé*. I obtained, however, a fine female underside variety, with many of the spots obsolete; fine *C. virgaureae* were frequent two miles or so up the gorge, and, throughout its length, *C. dorilis* was not infrequent, my captures of it included several of the magnificent local forms of the female, which is nearly as bright as, and much resembles, *C. gordius*, female; *Melanargia galatea* was plentiful, but the var. *leucomelas* was only met with in odd specimens, and they required looking for. The local *Coenonympha dorus* swarmed, and was in good condition; of *Polygonia egea* two specimens only, formed our united bag.

We had one day on the Collette, finding much the same species as on our other ground, with more female *P. meleager* and more *P. rippertii*, and my captures of this latter species included a good underside variety, with the spots greatly increased in size, and kidney-shaped.

We spent a morning on the right bank of the Bleone, and here unexpectedly found *Satyrus actaea* in profusion, and in fine order, quite a fortnight early. There can, I think, be no doubt of the distinctness of this species from *S. cordula*, which was flying on the same banks, but worn to shreds, and, as one saw the two insects on the wing together, the difference in flight was very noticeable; of the two, *S. actaea* is by far the more powerful and rapid. I also obtained a single *Hipparchia arethusa*, evidently this was just emerging.

Other species observed included—*Brenthis daphne*, plentiful, but with not a decent one amongst them; *Argynnis adippe*, types only; *A. niobe* var. *eris*, generally distributed; *Papilio podalirius*, getting towards var. *zanclens*, but not exactly it; *P. machaon*, rare, and one fullfed larva found upon *Sesile montanum*, from which I bred a fine imago during August; *Pontia daplidice*, just emerging and scarce; *Leptosia sinapis*, common, and including var. *erysimi*, and some intensely black-tipped males; *Colias hyale*, abundant and fine; *C. edusa*, one or two, evidently not fully out in the second brood; *Gonepteryx cleopatra*, not infrequent; *Everes argiades*, a few, worn; *Rusticus argus* (*acyon*), plentiful; *R. argyrognomon* (*argus*), very local; *Theela spini*, generally distributed and frequent; *Polyommatus corydon*, in swarms; *P. hylas*, fairly abundant, males only observed; *Limenitis*

camilla, going over; *Melitaea didyma* was abundant, with plenty of females, type form; *Epinephele lycaon*, very plentiful, and I got a fine series; *E. janira*, not fully out, and of the *hispulla* form. One or two *Carcharodus laraterae* were netted, with a few each of *Hesperia carthami* and *Pyrgus sao*.

One much looked forward to excursion, after *Melanargia iapygia* var. *cleanthe*, did not come off. *M.* var. *cleanthe* is found in the recesses of the "Montagne de Lure," some seventeen or eighteen miles from St. Auban. I had hoped that some kind of conveyance might have been procured, but careful enquiries, locally, could elicit nothing better than that "possibly" a mule might be got at one of the villages near; we had, therefore, reluctantly to conclude that 35 long, stony, mostly up-hill, miles, would comprise more walking than we cared to undertake under the tropical sun.

(*To be concluded.*)

HEMIPTERA.

HEMIPTERA IN THE NEW FOREST IN 1904.—I captured the following Hemiptera-Heteroptera whilst in the New Forest in July last—*Tropicoris rufipes*, very common, beating oaks; *Picromerus bidens*, bred from larvæ; beating oak produced *Phytocoris dimidiatus*: the three species of *Miris* were obtained by sweeping; *Aradus depressus*, under bark of oak stumps; *Monanthia dumetorum*, beating old blackthorns; *M. humuli*, by sweeping *Myosotis*; *Mycrophysa elegantula* ♀, by beating lichen-covered trees. I also took the following Homoptera—*Oliarus leporinus*, my best capture; the larvæ of *Ledra aurita* were common on oaks. I also captured many others which I am unable to work through at present.—W. WEST, 8, Morden Hill, Lewisham. *February 1st*, 1905.

COLEOPTERA.

Oxypoda sericea, Heer—a Species of Coleoptera New to Britain.

By HORACE ST. J. K. DONISTHORPE, F.Z.S., F.E.S.

On June 17th last I swept a small *Oxypoda* in Dulwich Wood, which I was unable to name, and which I sent eventually to Monsieur Fauvel. He has now returned it to me labelled *sericea*. It agrees with Heer's description (*Faun. Helv.*, i., p. 321), and also with what Ganglbauer has to say about it, so that so far all seemed plain sailing; but Ganglbauer; and Fauvel also, according to Fowler, consider *Oxypoda nigrina*, Wat., to be synonymous with this species. To make matters worse, the European Catalogue gives *nigrina*, Wat., as a synonym of *exigua*, Er., which is, of course, not the case. On comparing my insect with the specimens of *nigrina* in the Bates and Power collections, I found that it was quite distinct; also Mr. E. A. Waterhouse has kindly lent me his father's type of *nigrina*. We thus see that *nigrina* is a distinct and good species, and, therefore, my beetle is an addition to the British list. It comes nearest to *umbrata*, the tarsi being a little shorter and thicker. It is also smaller, and the first joint of the posterior tarsi is not, or hardly, longer than the two following taken together. From *nigrina* it may be known by its more fuscous colour, longer antennæ, and more strongly notched elytra.

Waterhouse, in his description (*Zoologist*, 1858, p. 6037), distinctly states that the elytra of *nigrina* are not so strongly notched as in others; he also says, "usually of an uniform sooty-black colour," and this is the case with all the specimens I have seen; whereas Heer describes his insect as "fusca, abdomine nigro." It seems as if Ganglbauer came to the conclusion that *nigrina* was *sericea* because both are described as having a very indistinct dorsal furrow to the thorax! He gives the distribution of *sericea* as "central Europe, rare."

Coleoptera in the New Forest in 1904.—During my visit, in July, 1904, to the New Forest, I captured several coleoptera not mentioned in Mr. H. Donisthorpe's list of December last. In the first place, the very rare *Tropideres sepicola*, F., fell to my lot by beating. At the time I thought it was *Cionopsis lunatus*, but, on examination at home, I soon found out the importance of my capture. I can only find two previous records, one specimen taken in Leicestershire, by Mr. F. Plant, and the other, Mr. Donisthorpe informs me, is in the Bates' collection, taken by C. Gulliver, also in the New Forest. I also took five specimens of *Liopus nebulosus* beating oaks in New Park; *Strangalia armata*, *S. quadrifasciata* and *S. nigra* sweeping flowers; *Phyllobrotica quadrimaculata* (2), beating alders in Matley Bog; *Telephorus testaceus* also occurred by sweeping. At Holmsley, six species of *Donacia simplex*, *sericea*, *bidens*, *typhae*, *limbata*, and *comari*, also *Nanophyes lythri*, *Hypera pollux*, *Scirtes hemisphaericus*, *Phytobius canaliculatus*, and *Grammoptera beccabungæ* were captured. Sweeping flowers in and near Stubby copse, I obtained *Modellestena humeralis*, *Longitarsus holsaticus*, *L. ochroleucus*, *Chaetocnema aridula*, *Aphthona cœnostula*, *Apteropeda orbiculata* and *Cryptocephalus moraei*. By beating sallows a fine and variable series of *Phytodecta viminalis* was taken. A series of *Orchestes cyanicus*, by sweeping on the railway bank, was also captured.

W. West, S. Morden Hill, Lewisham. *February 1st*, 1905.

Coleoptera in the Isle of Wight.—The following notes deal with some of the better species of coleoptera I have taken in the island during my various visits there, and comprise new localities for the beetles recorded, or new records for the island altogether. In the latter case they are marked with an *. *Bembidium pallidipenne*, Ill.—I took a nice series of this pretty little beetle by "sluicing" at the edges of a small stream, which runs into the sea at Brook. *Bembidium anglicanum*, Shp., I took at Blackgang Chine at the foot of the cliff, where *Cicindela germanica* occurs; Mr. E. A. Waterhouse tells me that he has taken it at Swanage also with *Cicindela germanica*. *Dromius rectensis*, Rye, has occurred at roots of grass on the sides of the cliffs at Blackgang. *Cnemidotus impressus*, F., was fished out of the *Hydrocotyle vulgaris* pond at Sandown; Professor Beare tells me he has also taken it there. *Ochthebius auriculatus*, Rey., was taken in the salt-marsh at Yarmouth, where I took *Scymnus levamai*; Mr. Champion has taken it at Sheppey, where he also took the *Scymnus*. *Cercyon littoralis* var. *binotatum*, Steph., was taken under seaweed on the shore at Ventnor, and *Aleochara lata*, Gr., in and under carrion at Chale, Brook and Parkhurst Forest. *Phytosus balticus*, Kr., Professor Beare and I took in some numbers under seaweed at Ventnor. *Tachyporus tomosus*, Mat., occurs at roots of grass, etc., at Chale and Blackgang. *Oxypus pedator*, Gr., I took

at roots of plants on the cliffs near Sandown; Mr. Champion has recorded it from Freshwater and Bembridge. *Ocypus fuscatus**, Gr., one specimen was taken under a stone in a field near Freshwater. *Quedius ventralis**, Ahr., was taken in the damp wood mould of a hollow tree at Freshwater. *Cyrtusa pauxilla*, Schm., and *Anisotoma dubia*, Kug., by evening sweeping in the Chale Chine. *Anisotoma similata**, Rye, two specimens were obtained, one at Blackgang and one at Chale, by evening sweeping. *Necrophorus interruptus**, Steph., occurred at Blackgang and more commonly at Chale under dead rabbits. *Nitidula quadripustulata*, F., and *N. rufipes*, L., not uncommon in old bones at Blackgang. Of *Diphyllus lunatus*, F., Beare and I took specimens in hard black fungus (*Concentricus*) on an old ash at Ryde. Of *Cryptophagus ruficornis**, Steph., I took a specimen in company with the above species at Ryde. *Heterocerus fusculus*, Kies., occurs on the mud at the foot of the cliffs at Blackgang and Chale. *Aphodius nitidulus**, F., and *A. rufescens**, F., were taken at Blackgang in stercore. *Trox scaber**, L., was found at the foot of the cliffs in Chale Chine. *Athous longicollis*, Ol., I swept two ♀s, which sex is always rare, at Blackgang. *Telephorus lateralis**, L., was swept at Brook. *Scirtes hemisphaericus**, L., was common on reeds in a swamp near Freshwater station. *Hedobia imperialis**, L., a specimen was found in a waterfall at Freshwater. *Ochina hederae**, Müll., was swept off old ivy at Blackgang. *Leptura livida*, F., was swept in plenty off herbage at the back of the bazaar at Blackgang. *Bruchus cisti**, F., occurred in plenty in the flowers of the rockrose (*Helianthemum vulgare*) on the downs near Freshwater. *Cryptocephalus bilineatus*, L., was not uncommon in company with *Leptura livida* at Blackgang, and was swept sparingly in the salt-marsh at Yarmouth. *Cryptocephalus pusillus**, F., a series was swept in Parkhurst Forest. *Luperus nigrofasciatus*, Goez., several specimens were swept in Chale Chine, evidently having been blown over the cliff from the gorse above. *Psylliodes chalcomera*, Ill., was swept off thistles in the undercliff near Blackgang. Of *Salpingus ater**, Pk., several specimens were beaten out of dead hedges at Blackgang; of *Anisoxya fuscula**, Ill., a specimen was found in a puddle in a gateway at Freshwater; and of *Mordellistena parvula* var. *inaequalis*, Muls., several specimens were swept in Chale Chine. Of *Apion sorbi*, F., I took a ♂ sweeping near the redoubt at Freshwater in August, 1903; this species, which is very rare, and the ♂ extremely so, is said to be found on *Matricaria chamomilla*, *M. inodorata*, *Anthemis arrensis*, *Prunus spinosa*, and also wild cherry. Of *Apion limonii**, Kirby, I took a nice series in August, 1903, at the roots of, and by sweeping, sea-lavender in the salt-marsh at Yarmouth, whilst of *Phyllobius pomonae* var. *cinereipennis**, Gyll., a specimen was swept off nettles on the top of the downs at the back of Blackgang in August, 1894. *Strophosomus faber**, Hbst., was not uncommon at roots of grass and in sand-pockets on the cliffs at Blackgang and Chale. *Sitones cambricus*, Steph., was swept at Chale. *Sitones meliloti*, Walt., was swept off *Melilotus officinalis* at Yarmouth. *Hypera trilineata*, Marsh, occurred plentifully on *Anthyllis vulneraria* at Chale in August, 1904. *Rhinocyllus latirostris*, Lat., was swept very sparingly off the big Scotch thistle in the undercliff at Blackgang in August, 1903; Mr. W. E. Sharp took it much more freely in the same locality in 1902. *Mecinus collaris**, Germ., I took a nice series in August, 1903, by sweeping the sea-plantain in the

salt-marsh at Yarmouth. *Ceuthorhynchidius horridus*, F., occurred freely in August, 1894, on various thistles in the undercliff at Blackgang, and very sparingly in the same locality in 1903. *Phytobius quadrinodosus*, Gyll. (=*Rhinoncus denticollis*, Shp. Cat.), I swept a specimen in the glade in Parkhurst Forest, where I took *Aphanisticus emarginatus*, F. *Pityophthorus pubescens*, Marsh., was also swept in the same locality as the last.—H. St. J. K. Donisthorpe, F.Z.S., F.E.S., 58, Kensington Mansions, S.W. *January 5th*, 1905.

Coleoptera in the Peebles district in 1904.—During last year I had several opportunities of collecting whilst away from home, some notes of which have already been given. The following species, all of which were obtained in the immediate vicinity of Peebles, comprise the better "takes" of the season. One *Stomis pumicatus*, Pz., was found under a stone in a wood by Tweedside, this being the only specimen I have taken in the district. *Bembidium doris*, Pz., occurred in numbers in May when "sluicing" the banks of the curling-pond. A solitary *B. monticola*, Stm., was taken in like manner on Tweedside, and *Hydroporus davisi*, Curt., and *H. septentrionalis*, Gyll., were captured by hand (rather a tedious process), amongst the gravel at the edge of a quiet pool on the river. *Helophorus arvernicus*, Muls., occurred once, on a sandy stretch of river-bank, where, on a hot day, very many beetles were to be seen. Under moss-covered bark on a fallen tree, I took a single example of *Bolitochara lucida*, Gr., and *B. obliqua*, Er., was fairly common, whilst one *Hapalaraea pygmaea*, Pk., was shaken out of some débris beneath cut fir-branches. Under fir bark I took *Rhizophagus ferrugineus*, Pk., and in flood-refuse, in January, *Paramecosoma melanocephalum*, Hbst. In June, I came across a colony of *Sinodendron cylindricum*, L., in a decayed tree, this being the first time I have seen this fine beetle here. *Aegialia sabuleti*, Pk., was captured on the sandy bank already referred to, but not at all commonly, in May, and at the end of July I had one of the best captures of the season, *Salpingus ater*, Pk. Two examples of *Psylliodes picina*, Marsh., were obtained from flood-refuse in November. One of the earliest captures of the year, also from flood-refuse, was *Tropiphorus carinatus*, Marsh., which I took January 11th. Amongst other weevils I took *Grypidius equiseti*, F., by sweeping in a wet ditch; *Ceuthorhynchidius quercicola*, Pk., was also obtained by sweeping. Beneath the bark of a dead branch of fir, I secured a number of *Tomicus acuminatus*, Gyll., and during the year I have taken three examples of *Pityogenes bidentatus*, Hbst. I have again to express my indebtedness to Prof. T. Hudson Beare for kindly verifying the above species for me. James E. Black, F.E.S., Nethercroft, Peebles, N.B. *January 23rd*, 1905.

Chrysomela orichalcia, Mull., var. hobsoni, Steph., in the Northumberland and Durham district.—Very local. In August 1904 I took a nice series on the Wear, at South Hylton. They all occurred from under decaying hemlock leaves, lying close to the ground in a certain favoured spot scarcely four yards in extent, and amongst all I took there was not a single example of the type *orichalcia*. All but one answered to Stephens' (*Man. Brit. Col.*, iii., p. 310, and *Man.*, iv., 313) and Canon Fowler's (*Brit. Col.*, iv., p. 305, pl. 131, fig. 4) descriptions of the var. *hobsoni*. The solitary exception, a ♀, was, in comparison, much larger, and was of a dull unicolorous purple;

the var. *hobsoni*, possessing æneous pitchy or brown-black elytra, the thorax at most being smooth and brassy. Recorded by Canon Fowler from Manchester in abundance (Stephens), Crohamhurst, Surrey, and Honington (Power).—RICHARD S. BAGNALL, F.E.S., The Groves, Winlaton-on-Tyne. *January 9th*, 1905.

SCIENTIFIC NOTES AND OBSERVATIONS.

PROPORTION OF SEXES IN PIERIS BRASSICÆ.—From the 50 larvæ of this species I found at Selborne in September, 1903 (see *Ent. Rec.*, vol. xv., p. 292), 24 perfect insects resulted, thirteen of which were males and eleven females. This result is quite in harmony with those obtained by Standfuss, who found the males to exceed the females by 5 per cent. (see *Ent. Rec.*, vol. xvi., p. 313). I may, perhaps, also mention that one of the males has a black discoidal spot on the upper-side of each forewing, being the aberration *nigromotata* of Jachontoff.—(REV.) G. H. RAYNOR, M.A., Hazeleigh Rectory, Maldon. *February 4th*, 1905.

PROPORTION OF SEXES IN LEPIDOPTERA REARED FROM THE EGG.—In various broods of lepidoptera reared from the egg, the following data may prove interesting :—

	TOTAL. ♂ s	♀ s
Malacosoma castrensis, 1899, 33 ♂ s, 43 ♀ s; 1900, 21 ♂ s, 28 ♀ s ..	= 54,	71
Ennomos quercinaria, 1895, 46 ♂ s, 60 ♀ s; 1896, 13, 3 ♂ s, 10, 4 ♀ s; 1897, 2 ♀ s	= 62,	76
Selenia tetralunaria, 1894, 4 ♂ s, 2 ♀ s; 1895, 4, 50, 0 ♂ s; 9, 38, 4 ♀ s	= 58,	53
Amphidasys strataria, 1895, 13 ♂ s, 7 ♀ s; 1896, 58 ♂ s, 64 ♀ s ..	= 71,	71
Amphidasys betularia, year (?), 118 ♂ s, 114 ♀ s..	= 118,	114
Syntomis phegea, 1900, 19 ♂ s, 23 ♀ s	= 19,	23
Spilosoma lubricipeda var. *zatima*, 1900, 75 ♂ s, 74 ♀ s; 66 ♂ s, 30 ♀ s; year (?), 20 ♂ s, 30 ♀ s..	= 161,	134
S. urticae, 1899, 52 ♂ s, 34 ♀ s; 1900, 122 ♂ s, 132 ♀ s..	= 174,	166
S. mendica, 1900, 8 ♂ s, 9 ♀ s	= 8,	9
Lymantria monacha, 1894, 13 ♂ s, 19 ♀ s; 1895, 47 ♂ s, 64 ♀ s; 1896, 4 ♂ s, 7 ♀ s; 1897, 6 ♂ s; 8 ♀ s	= 70,	78
Taeniocampa munda, 1900, 153 ♂, 140 ♀ s	= 153,	140
Taeniocampa stabilis, 1896, 9 ♂ s, 10 ♀ s; 5 ♂ s, 5 ♀ s	= 14,	15
T. populi, 1895, 6 ♂ s, 11 ♀ s	= 6,	11
Cucullia umbratica, 1899, 10 ♂ s, 17 ♀ s	= 10,	17
Axylia putris, 1899, 50 ♂ s, 47 ♀ s..	= 50,	47
Orrhodia vaccinii, year (?), 39 ♂ s, 43 ♀ s..	= 39,	43
Peridroma saucia, year (?), 69 ♂, 78 ♀ s	= 69,	78
Demas coryli, 1896, 10 ♂ s, 12 ♂ s	= 10,	12
Total	= 1146,	1178

That is, 49 per cent. ♂ s, 51 per cent. ♀ s.—A. W. BACOT, F.E.S., Bow House, 154, Lower Clapton Road, N.E. *February 12th*, 1905.

THE ECONOMY OF TASMANIAN PSYCHIDS. — A REPLY FROM MR. LITTLER. — I have just seen a copy of the *Entomologist's Record* for September, 1903, which contains a criticism of a note of mine on *Entometa ignobilis* in the *Entomologist* for August, 1903. I never, unless my attention has been directed to an error, read any of my published notes or articles. On turning up the *Entomologist* I found to my surprise the note containing statements contrary to my belief. The portion taken exception to (and rightly so) in your magazine does not express my opinion but that of Prof. McCoy. The note is incorrect

and incomplete as far as the statements in question are concerned. I am very sorry I should have been so careless, making such a stupid blunder. The article in December, 1904, number of the *Entomologist* on *Clania lewinii* (a species similar in habits to *E. ignobilis*) is the result of very careful study with plenty of material and patience. I do not think it will be necessary to modify any of my statements, further careful research will tell though. I have never seen *British Lepidoptera*, vol. ii, mentioned in the criticism in the *Entomologist's Record*. —FRANK M. LITTLER, Althorne, High Street, Launceston, Tasmania. *January 16th*, 1904. So far as we understand this, Mr. Littler throws the responsibility of these errors partly on the editor of his papers in the *Entomologist*, "the note containing statements contrary to his belief," and partly to his own errors of transcription, his remarks being mixed with those of Prof. McCoy, but his later paper referred to seems as unsatisfactory as his first, and his letter shows our recent criticism (*anteà*, p. 54), to be fully warranted. Mr. Littler admits carelessness, but our idea is that such obvious errors should not be printed at all in our British magazines. They reduce science to absurdity whoever may be responsible.—ED.

LACHNEIS LANESTRIS, CONDITION DURING PUPAL STATE. —It may be well to complete the history of the pupæ referred to, *Ent. Rec.*, vol. xiv., p. 123, line 8. The last of the four pupæ there noted (pupated 1901) was still alive and quite undeveloped last summer. Yesterday I examined it, and found it to have the imago fully developed, so brought it into a warm room, when, this morning, a ♀ emerged and fully developed its wings. —T. A. CHAPMAN, M.D., Betula, Reigate. *February 5th*, 1905.

THE HYBERNATING STAGE OF ADKINIA ZOPHODACTYLUS. —Is *Erythraea centaurium* an annual? My bookshelves only provide seven authorities, most of them rather ancient—Lindley, Hooker, Brewer, Wood, etc. All these say it is an annual except Ardouini in the *Flore des Alpes Maritimes*, which says it is biennial. I have a dim recollection of knowing their winter rosettes when I was a student, and, at Hereford, seeds sown did not come to flower till the second year. I tried to make the matter out this summer, and with these authorities before me, failed to find anything to contradict them. However, Mr. Tutt having raised the question again, and as he possesses that instinct which is often right, though unable to give a reason, but no doubt founded on forgotten observations, I made a special investigation this afternoon (December 31st, 1904), that the matter might be cleared up before the year expired. Last September I found a place where *Erythraea centaurium* was very abundant, but no trace of *Adkinia zophodactylus*, and after a good search I failed to find hybernating rosettes of the *Erythraea*. To-day, however, I was more successful; I found half-a-dozen rosettes of the plant, such as those of which I had a dim recollection. I further examined a number of dead plants that had flowered last season, some of these were very large and branched and eluded me in what I looked for, but some of the smaller and simpler specimens distinctly showed, at ground level, a thickening with crowded leaf scars, the position in fact of last winter's rosettes; of course, if the smaller plants had hybernated the larger must have done so. January 1st, 1905. To-day I looked at my hybernating plume moths *Emmelina monodactyla* appears to

be quite satisfactory; *Amblyptilia acanthodactyla*, some alive, a considerable number, however, dead. These, however, had been indoors, and probably had got too dry at one time or another. Of *Adkinia zophodactylus* I could find no living moth. I must, therefore, quite withdraw my hypothesis that the moth hybernates, and, whilst not considering anything proved, must admit Mr. Tutt's idea that eggs are laid in the late autumn (on the wintering rosette buds), for the present holds the field. This brings *A. zophodactylus* into line with its congener, *A. bipunctidactyla*.—T. A. CHAPMAN, M.D., Betula, Reigate, *January 1st*, 1905.

PRESERVATION OF LARVÆ FOR SCIENTIFIC WORK.—Larvæ in glycerine shrink. I always put them in 5, 10, 15, and 20 per cent. solutions of "zinc chloride," and then in 50, 60, 70, and 80 per cent. solution of glycerine. The result, however, does not then seem to be satisfactory, and the larvæ seem by no means well adapted for later preparation. What treatment do your readers consider best, so that the larvæ are suitable for work and reference?—M. GILLMER, Cothen (Anhalt), Schlossplatz 2, Germany.

NOTES ON COLLECTING, Etc.

PLATYPTILIA PALLIDACTYLA AT DUMFRIES.—I am able to say, thanks to Mr. E. R. Bankes, who has kindly named the specimens for me, that the species taken at Dumfries and recorded (*anteà*, p. 23) as *Platyptilia ochrodactyla* is *P. pallidactyla* (*bertrami*).—W. G. CLUTTEN, 132, Coal Clough Lane, Burnley. *February 3rd*, 1905.

ARCTORNIS L-NIGRUM, MÜLL., AT CHELMSFORD.—Miss E. Miller, of Chelmsford, one of the Associates of the "North London Natural History Society," has just sent to me as Research Secretary of the Society, a ♂ specimen of *Arctornis l-nigrum* (*Laria c-nigra*) for determination. She noticed the resemblance, in many respects, to *Stilpnotia salicis*, but apart from the conspicuous black V (which might conceivably have been a varietal mark), she was observant enough to see that the antennæ also differentiated it, and, not being acquainted with extra-British species, she was naturally at a loss to think what it could be. The specimen was taken at an electric lamp at Chelmsford, last July, and is in very fair condition, but not quite perfect, the left hindwing having a little slit in its margin. Whether it is more likely to have migrated voluntarily, or been introduced accidentally in an earlier stage, or whether anyone had been breeding the species in this country and let this specimen escape, I will not pretend to be able to decide; it is inconceivable that so conspicuous a species can have been a regular resident with us, unobserved, ever since the olden days when it was, or was believed to be, British. But in any event, I thought the capture of considerable interest, and have obtained Miss Miller's permission to publish a record of it.—LOUIS B. PROUT, F.E.S., 246, Richmond Road, N.E. *February 1st*, 1905.

AGRIUS CONVOLVULI AT SUDBURY, SUFFOLK.—During last August and September *Agrius convolvuli* was fairly plentiful in this district; my own captures took place on August 21st and 25th.—EDWARD RANSOM, 16, Friars Street, Sudbury, Suffolk. *February 21st*, 1905.

COLIUS EDUSA AT SUDBURY, SUFFOLK.—Several specimens of *Colias edusa* were caught here towards the end of July and beginning of

August last year; but they were extremely local, being entirely confined to one clover field.—IBID.

LEPIDOPTERA OBSERVED AT BASLE.—Many lepidopterists who visit Switzerland go through Basle, few appear to stop there, and one suspects there is little enough entomologically for which to stay. However, inability to hurry kept me there for a day or so, and having spent one day looking about the town, I took, on July 23rd (1904), my net and zinc collecting-box, and set out to see what the country near the city was like. Ignorance of where to find the waste places around, led me to take the road leading from the Central Railway station, past the Margarethen Park, and so towards Flühen. The country was, however, highly cultivated, and there was little to note entomologically, the only point, perhaps, being the great abundance of *Pieris rapae*, *P. napi* and *Colias hyale* in all the lucerne fields in the neighbourhood. I believe I have before recorded a remarkable habit of the last-named species. When a male has succeeded in really attracting the attention of a ♀, he flies directly into the air, the ♀ following him, circling closely round and beating with her wings, often ascending high into the air and descending again, only to continue the chase by going up again, and, usually, finally separating and flying in different directions. I still think, somehow, it is a courting habit, yet I have never seen an actual pairing result therefrom, although I have seen the ♀ settle and the ♂ hover around her as if he intended pairing, both, however, finally flying away. It has been suggested that it is a repelling habit due to the ♀ having been already fertilised—a quite possible solution. A ♀ *C. hyale* approaching the ♂ in colour also interested me much. Strangely enough *C. edusa* was scarcely observed, although *Gonepteryx rhamni* ♂s were already out, and *Pontia daplidice* was worn and hardly worth taking. *Pararge megaera* was common, and *Epinephele ianira* swarmed everywhere, as also did *Polyommatus icarus* and *Coenonympha pamphilus* in suitable places. *Thymelicus lineola* and *Melanargia galatea* had evidently been abundant, but were now in very bad condition, whilst a single *Nisoniades tages* suggested a partial second-brood as is occasionally, in hot summers, the case with us. *Chrysophanus phlaeas* was just coming out, so also was *Polyommatus astrarche*, but *C. dorilis* was, though quite abundant, in rather poor condition, quite a large number having to be overhauled for a score of good specimens. The ♀s were somewhat variable, the general tendency being towards having dusky, and not bright coppery, forewings. I may add that a large number of little *Pieris napi* ab. *minor* and *P. rapae* ab. *minor*, were observed, the greater number, however, of these species being quite up to the average size. Only two moths attracted attention, *viz.*, a specimen or two of *Anthrocera ephialtes*, six-spotted, and with red abdominal belt, on lucerne flowers, and *Acidalia immorata*, disturbed rather commonly out of the bankside weeds by the side of a clover field. A strange *contretemps* occurred just beyond St. Margaret's Church. I had chosen the upper of two apparently main roads as being the most promising, and had got some little distance along it when I was accosted by a rough looking individual, whose German I understood as little as he followed my English. He knew no French, and exhibited a metal ticket taken from his pocket which led me to suppose he was a sort of forester, and all I could gather was that the road was for-

bidden, or that he wanted two francs, and that if I persisted in going along the road, the police station was below. In this predicament I took the lower road, with the British intention of getting back to the upper as soon as a cross road allowed, but I found none, and did not come across the man again. Can any of our Swiss readers tell me what was wrong?—J. W. TUTT, 119, Westcombe Hill, S.E.

FOES OF PUPÆ OF NONAGRIA TYPHÆ, THNBG.—With reference to Mr. J. Ovenden's note (*Ent. Rec.*, xvi., pp. 294-5) on the wholesale destruction of pupæ of *Nonagria typhae*, Thnbg. (*arundinis*, Fb.), by "mice or voles" in one spot near Strood last year, it may interest him and others to learn that great destruction of pupæ of this species is carried on in a similar manner every season in a locality in this neighbourhood, where I discovered it about four years ago. Although I have before now heard the rasping noise made by the insect's foes when engaged in gnawing into the stems of the great reed-mace (*Typha latifolia*) in search of pupæ, and have done my best to catch sight of them at work, I have not as yet succeeded, but am inclined to think that in this case the culprits are neither mice nor voles, but common brown rats, which infest the spot. Were it not that some of the *Typha* stems containing pupæ are, no doubt, always surrounded by water, and therefore free from such attack, it seems to me that the insect would inevitably have been exterminated in the locality in question.—EUSTACE R. BANKES, M.A., Norden, Corfe Castle. *January 2nd*, 1905.

VARIATION.

VARIATION OF GEOMETERS.—On August 31st last I was in Halifax, and during the evening paid a visit to Greetland Moor. The night was still and close, with thunder in the distance, and Geometers were very common, especially *Cidaria populata*, *C. testata*, *Larentia didymata*, and *Hypsipetes elutata*. These were all more or less variable, the best forms being *L. didymata* ♀ with a very distinct band, and some very light forms; *C. testata* with scarcely any dark markings outside the band, which was of a dull flesh-colour, and thus stood out very distinctly. There is a somewhat similar form figured by Barrett (fig. D); also several dark forms (fig. E). The *H. elutata* were of the common dark moorland form. The only other insects taken were one *Polia chi* ab. *olivacea*, on a wall, and one *Agrotis lucernea* at dusk. —W. G. CLUTTEN, 132, Coal Clough Lane, Burnley. *January 5th*, 1905.

APLECTA NEBULOSA AB. ROBSONI.—I must strongly protest against the splitting up of the well-known aberration *Aplecta nebulosa* ab. *robsoni*. The ab. *thompsoni* of Arkle, is at most simply a glorified form of ab. *robsoni*, Collins, and, as such, has been known for years to all who have worked Delamere. It is not a new form, and does not require a varietal name. When will lepidopterists cease this absurd mania for subdividing aberrations? I might as well begin to coin names for about 200 *Boarmia repandata* ab. *conversaria* that I have, and which show a far greater divergence from the original ab. *conversaria* than does this ab. *thompsoni* from the original ab. *robsoni*.—HERBERT MASSEY, F.E.S., Ivy Lea, Burnage, Didsbury. *January 2nd*, 1905.

NOTES ON LIFE-HISTORIES, LARVÆ, &c.

EGGS OF LEPIDOPTERA.—*Acidalia immorata.*—These eggs present very few that are not more or less shrunk and shrivelled. The following notes, however, can be made. They are ·63mm. long, ·38mm. wide at broader, about ·33mm. at smaller, end, with depth of about ·28mm. at thinner end, and ·31mm. at thicker, being thus of usual Geometrid shape. They are longitudinally ribbed, the ribs being waved by the alternating secondary ribs. The ribs are rather blunt, but the troughs are fairly deep, the secondary ribs are not well marked, but quite evident. The ribs are 22-24 in number, uniting to smaller numbers at thin end, at the thick end they cross one another almost at right angles, in a pattern like engine-turning, resulting in a series of round tubercles or knobs at the points of intersection. This is really a modification of the resolution of a network into ribs, but produces this curious pattern, not unlike the knobs on a Lycænid egg, but relatively much larger, and on a square, not a hexagonal, pattern, but even so, becoming more hexagonal centrally. The colour appears to be green, changing to grey-brown, but in some with pink spots. The smaller end has a similar knobbed reticulation, but less regular, to that on the large end, the micropyle not made out. It is, perhaps, necessary to say that the "knobs" are rounded elevations as of higher points where waves cross, and not the definite added structures they appear to be in Lycænids. Eggs laid August 23rd, 1900, by a ♀ taken at Aix-les-Bains, and described September 4th 1900.

Acidalia perochraria. This is a most beautiful object, the netting being large, very correctly hexagonal, and markedly black, the deep hemispherical cups which occupy the spaces between the netting are uncoloured, and have a deep olive-green colour, due to egg-contents, under the shading of the network. The network is of rather fine lines and looks suspended over the opaline interior, reminding one in some degree of the network cocoons of some moths (Plutellids, &c.). The deep, regularly hemispherical cups are certainly unusually deep, and, looking at the side of the egg, one looks beneath the black marginal line, though the transparent walls of two adjacent cups, adding greatly to the impression of the netting being suspended at some distance from the egg. The network is very regularly hexagonal, a pentagon here and there thrown in, to meet the exigencies of a rounded surface. The egg is of typical Geometrid shape, *i.e.*, it has three unequal diameters, and is, further, somewhat tapered to one end. The long diameter is ·47mm.; the transverse about ·36mm. at the widest part; ·29mm. at a corresponding point towards the narrow end; the height is about ·30mm. at the thick end and ·21mm. at the thinner. The netting has some fine meshes at the smaller end, which probably represent the position of the micropyle. I have not succeeded in getting a good view of these, and cannot make out any definite rosette. The diameter of a hexagon of the network is about ·04mm. Eggs laid August 22nd, 1900, by ♀ taken at Aix-les-Bains, described September 4th, 1900.

T. A. CHAPMAN, M.D., F.E.S., Betula, Reigate.

Melanippe hastata. Pale yellow in colour; upper surface very shiny to the naked eye; oval in outline, one end (? micropylar) rather squarer than its under; almost the whole of the upper surface regularly

depressed, the surface very minutely pitted. Length : breadth : height apparently about 5 : 4 : 3. No further structure to be made out. [Laid by ♀ taken at Chamonix, August 14th, 1902, described August 17th, 1902.]—J. W. TUTT.

Anthrocera exulans.—Rather pale yellow; almost regularly oval except for a slight flattening at one end; length : breadth as about 5 : 3½, the height apparently almost equal to width, the egg being very full, without any depression, also uniformly yellow throughout, without any pale pole as in the eggs of some other Anthrocerids. Surface somewhat shiny, apparently finely pitted; eggs laid regularly in rows naturally, often in heaps in confinement. [Egg laid August 18th, 1902, by a ♀ from the Montanvert.]

Crambus conchellus.—Small for size of moth; oval in outline, except that one pole is slightly flatter than its nadir (? micropylar); the length : breadth as about 5 : 4; the longitudinal ribs well marked, four seen on upper surface when egg is lying flat on table, faint transverse ribbing crossing longitudinal ribs at right angles. Laid loosely. [Eggs laid August 19th, 1902, by ♀ taken same day on Brévent, at about 6700ft.]

These eggs were described simply with a good hand lens, the only apparatus I had with me at the time.—J. W. TUTT.

Boarmia rhomboidaria (gemmaria).—These eggs are laid in batches of from 5 to 12 on the small twigs of the foodplant. They are attached to one another side to side, leaving the micropylar end uppermost. The egg is remarkably beautiful and represents a high stage in the development of the Geometrid group. Its shape is cylindrical, twice as long as broad, and rounded off equally suddenly at both ends. In colour it is bright arsenic-green when first laid; three days after patches of pink of a glorious shade appear. At the end of seven days the colour of the egg was bright pink, slightly mottled with olive-green. On the tenth day the whole was a dull slate-colour, and on the 12th day it hatched. The egg is beautifully regular in shape, with a hard surface, not shiny, except at each rib. These ribs are accurately vertical and horizontal. The vertical ribs are very strong and thick. The horizontal ribs are very sharp and thin. There are 26 vertical ribs at the equator, only fourteen of which run up to the stellate area, and there are 26 transverse ribs from base to stellate area. The stellate area is truly Geometrid in form, very large, and consisting of the usual honeycomb pittings, with beads at the junction of each rib. These beads are very large and very glowing white in this species. The micropyle is fairly large in proportion to the egg and has nine curvilinear petals rapidly descending to the central crater. The measurements of the egg are given in mm., those of the micropyle in $\mu\mu$. (micro mm.), and are as follows: Egg—total length, ·54mm.; total breadth, ·27mm.; diameter of stellate area, ·24mm. Micropyle—diameter, 50$\mu\mu$.; longest petal, 24$\mu\mu$.; shortest petal, 23$\mu\mu$.; diameter of central crater, 2·5$\mu\mu$. [Described under ⅜″ obj. lens with 12″ lens eye-piece on August 4th, 1900.]

Zeuzera pyrina.—This egg is laid in a very irregular manner, pushed by the ovipositor into crevices in the bark, and so frequently crushed out of shape. In such cases the eggs are laid in a mass, but where there is more room they are laid in long strings of from eight to ten, some of them attached end to end, some side to side, and some even end to side. In all cases they are a little crushed. The egg is

remarkably small and elementary, closely resembling those of the Tortricids, Adelids, and Œcophorids. Its shape is a very irregular oval, tapering slightly towards the micropylar end. In colour it is yellowish-salmon, brightening to light cream at the micropylar end. It is flaccid, irregular, with shining surface irregularly divided into 4-, 5-, or 6-sided polygons by fairly sharp ribbing. This ribbing, however, becomes smoother and more curvilinear towards the thick end of the egg, and finally vanishes. Towards the micropylar end fifteen cells come up to the stellate area (the area immediately round the micropyle). This area is itself very irregular, and consists of two much-broken rings of polygonal cells marked out by semi-transparent ribs, which thicken externally, and gradually pass into the ordinary cells of the body of the egg. The micropyle is also very irregular and remarkably small, even smaller than one of the average cells on the body of the egg. The outline of each cell of the rosette which forms the micropyle is more rectilinear than is the case in more advanced groups, which gives these cells a triangular appearance. These cells usually number fourteen, but are sometimes irregularly combined in pairs so as to give the appearance, under low power, of being only seven in number. The ribbed margins of these cells meet at the very centre of the micropyle, and form a conspicuous crater. The following are the measurements of the different parts of the egg:—Total length 1·282mm. Total breadth (*a*) at centre ·74mm.; (*b*) at rounded end ·74mm.; (*c*) at micropylar end .54mm. Diameter of stellate area ·154mm. The micropylar measurements made in micro-millimetres (10000$\mu\mu$. 1mm.) are as follows: Micropyle—greatest diameter 51·5$\mu\mu$., shortest diameter 43·5$\mu\mu$., longest petal 25$\mu\mu$., shortest petal 12·5$\mu\mu$., central crater 9·3$\mu\mu$. The average size of diameter of cell on body of egg is 65·3$\mu\mu$. Described under ⅛" objective lens with 27" (Zeiss) eyepiece (very high magnification) on September 11th, 1900.)

—(Rev.) R. Freeman, M.A., Prescot, Lancashire.

Larva of Brenthis thore at hibernating stage.—The larva is in this stage 5mm. long, a little retracted, can vary from 4mm. to 6·5mm.; when contracted looks very short and thick, the approximation of spines and hairs making them seem part of the solid larva. Colour black, with a row of subdorsal yellow marks. There are three rows of spines down each side, and the yellow marks are between the 1st and 2nd rows (1st row of spines being the subdorsal one, 3rd marginal). The marks occur two on prothorax, one each on meso- and metathorax, and one each on 2nd, 4th, 6th, and 8th abdominals. The thoracics are small and whitish (very faint lemon-yellow), those on the abdomen are largest in front, and are almost orange, and each has a depressed or dark dot centrally, legs black, prolegs with the soft part greenish-grey. A careful examination of the spines and tubercles shows that they are tall pyramidal horns or warts clothed with eight or ten bristles, each on its own separate raised conical base, and with one, little larger than the others, as a terminal spine. Then there are lower raised bosses with hairs (Arctiid in character), and further hairs separate from the warts that might be secondary tubercles or merely skin hairs. The tall horns are first a subdorsal one, that appears to be i + ii conjoined, then a supraspiracular one that seems to be iii, and a subspiracular one that is v, or iv + v. These three are of almost *identical size and aspect*; vi seems to be represented by an Arctian

wart with eight or nine hairs; vii is a corneous plate with twelve or fourteen hairs at base of prolegs. On the 1st and 2nd abdominals are, below v, two smaller Arctian warts (vi and vii ?), one above the other, and then a small ventral wart of three or four hairs. On the 7th, the arrangement is the same, except that the ventral wart has one good hair and a minute accessory, and there is a single hair between it and vii (?); the 8th is practically identical, but the warts a little reduced. On each abdominal segment the skin-hairs (secondary tubercles) are all behind the main circle of horns and warts; dorsally are 4, arranged as though they were the trapezoidals, but they are all dorsal to i+ii. Between i+ii and iii and down to just below the spiracles are others; there are hardly any ventrally, except as accessory to the ventral tubercle. The prothoracic plate is very small, but has a tall pyramid on each side and rather in front of it, apparently attached to it, as if a development of the front angle of the plate; immediately behind the plate are two small warts; below the plate on each side are successively three (Arctian) warts, the spiracle being behind and a little above the middle one. The 2nd and 3rd thoracics have a large dorsal pyramid on each side of the middle line, fixed together by a narrow black chitinous slip, behind which are a pair of strong solitary hairs, and others behind the main transverse line of warts appear to be symmetrical. The line of warts, after the first large one, consists of four (Arctian) warts, of which the fourth is double, or has a small accessory one in front of it. These two segments have, however, another pair of pyramids; these are well in front of the main transverse line, and are a little outside the main pair, in fact, just outside the first (Arctian) wart. The 9th and 10th abdominals are not easily distinguished as to what belongs to each; there is on the 9th a pair of tall pyramids, a pair of small (Arctian) warts, and (on the 9th), ventrally, a small wart and a hair or two. The anal plate is densely black, square, and has on each side a tall pyramid (unless this belongs to the 9th). [From larvæ received from Mr. St. Quintin, who will probably give biological details in due course. Reference may be made to vol. xvi., pp. 236 *et seq.*, pl. ix and x, for figures and description of the egg and newly-hatched larva.]—T. A. CHAPMAN, M.D., Betula, Reigate. *January 15th*, 1905.

A QUESTION AS TO THE PUPAL SUSPENSION OF POLYOMMATUS CORYDON.—Mr. Lowe sends me two pupa-cases of *Polyommatus corydon*, and asks me to say what light they throw on the question as to whether the pupa is suspended or lies free on the ground. The authorities, led by Mr. Tutt, apparently say that it lies free and unattached, whilst Mr. Lowe feels pretty certain that these particular specimens were suspended, though they were shaken loose in travelling home. The pupæ present no trace of ever having had a girth; the anal extremity is rounded and possesses a good many short straight hairs, but none of them hooked in the ordinary way of the cremastral hairs in pupæ that are attached to silken pads. It is quite certain, therefore, that if by suspended we mean attached to a silken pad by a girth and a cremaster, these pupæ are not suspended, but quite free and unattached. But this is not the whole story. When the pupæ reached me one had still attached to the anal extremity the cast larval skin, from the other the larval skin was loose, but had evidently been recently attached precisely as the other was. Anteriorly, these skins were somewhat dilated to receive the ends of the pupæ, and were still longer than broad (5mm. and 2mm.). It was obvious that the cremastral hairs enabled the

rounded end of the pupa to maintain an attachment to, or entanglement with, the front of the larval skin, which was to this extent not cast, and embraced the posterior end of the pupa. That this attachment was tolerably firm, is evidenced by the fact that Mr. Lowe had tied a thread round these skins and so restored to the pupæ what he had seen to be their natural state of suspension, and that the connection held, not only till after the emergence of the imagines, but afterwards, in one case, till it reached me, in the other till it was *en route*. Unfortunately, the thread had, to a considerable degree, altered the aspect of the free end of the empty larva-skin. I entertain, however, little doubt that the larva-skin maintains a slight attachment to the surface on which it rests for pupation, slight, but usually sufficient to last for the short period the insect is in pupa. This method of false suspension obtains in several Satyrids; my memory is not clear as to whether I have seen it in some Lycænids. These *P. corydon* pupæ were from the Stelvio, and it would be interesting to know whether the pupal habits in this respect are everywhere the same. Hellins describes the larva of *P. bellargus* as going underground to pupate, and if unable to do so as making a slight cocoon amongst the leaves of the food-plant. Ruhl says (authority not quoted), that *P. corydon* buries itself in the ground and makes no girth. The typical habit then is to bury itself, but if forced to remain above ground it probably spins a slight cocoon, and in each case the empty larva-skin remains attached to the pupa and affords it some fixity and steadiness, and may frequently retain it in a quasi-suspended position should the larval crochets retain any hold, as they probably usually do when the larva is reduced to the cocoon expedient, or meet with any other web of silk. T. A. CHAPMAN, M.D., Betula, Reigate. *December 8th*, 1904.

I should like to add one word to Dr. Chapman's interesting investigations *re* pupæ of *Polyommatus corydon*. The larvæ taken by me at the Stelvio, were all crawling in the dust on the road itself, and I saw others. The dust was thick on the road, and the larvæ left deep tracks and were themselves coated with dust. They may, therefore, have been seeking a place to bury themselves, and removed by me to the larva-cage, pupated under unlooked for conditions, to which they adapted themselves. FRANK E. LOWE, Guernsey. *December 6th*, 1904.

CURRENT NOTES.

British entomologists "who take their walks abroad," will be interested to know that Herr Gabriel Höfner, Wolfsberg, Karnten, Austrian Tyrol, has published a work entitled *Die Schmetterlinge Kärntens*, which deals with the Lepidoptera of Carinthia, and which should be of great service to any entomologist visiting that particular corner of the Tyrol. The work costs 4 marks, which amount should be remitted direct to Herr Höfner, at the address given above.

Thanks to Messrs. Bankes, Ovenden, Whittle and others, we were able to get photographs and descriptions of many ova, larvæ and pupæ of the "plume" moths last year. It is difficult, however, to make out the details of the eggs when *in situ*, and a fresh lot of photographs giving more detail is badly wanted. Eggs or larvæ and pupæ for photographing should be sent to Mr. A. E. Tonge, Aincroft, Reigate, and those for description to Mr. A. W. Bacot, 154, Lower Clapton

Road, London, N.E., or to Mr. A Sich, Corney House, Chiswick. At present Dr. Chapman is on the continent, and material should not be sent to him until his return. If as much work is done by our field-helpers as last year, our account of the "plumes" will be the most complete of any group of British lepidoptera yet attempted.

The *Entomologisches Jahrbuch* for 1905 contains its usual amount of entomological material to suit various tastes, from the general monthly hints on field-work for the coleopterist to the description of new aberrations of lepidoptera. There is nothing really in the book that specially belongs to 1904, nor anything that has any scientific value beyond the usual matter to be found in magazines, *e.g.*, "Lepidoptera collected in Styria in 1902," "List of the Liparids, Saturniids, Drepanulids and Cymatophorids of Chemnitz," "Varieties and aberrations of *Triphaena comes*," "Lepidoptera taken in the neighbourhood of Prague," "Coleoptera of Frankish Switzerland," "Coleoptera of Thuringia," etc. A very poor section is the "Entomological book-list" for the year—this includes a large number of "price lists" of various dealers, notices of the proceedings of one or two societies, and not a single book of real scientific value. The compiler evidently knows nothing about the best entomological books published in 1904. The *Jahrbuch* is an excellent sample of the mixed medley that appeals to the collector all over the world, and that serves the scientific man's purpose for a detail or two of variation or geographical distribution if he just remembers where to put his hand on them when he wants them. One suspects, however, that like most of the contents of our transactions and magazines, these sink largely into the vast area of forgottenness, there being far too few people at work in classifying these facts before they become too overwhelming, and in rescuing the grains of wheat from the bushels of chaff in which most of the facts are buried.

The appearance of a second edition of Davenport's *Statistical Methods**, &c., is some proof that the correct handling of biological statistics is now practised by a by no means small number of students. This edition embodies many of the newer methods of Professor Karl Pearson, with a summary of some of the results gained by them. The volume contains almost everything that is required by anyone entering upon any statistical enquiry on any biological subject, especially variation. The first chapter is on how to measure objects, and describes succinctly and accurately how one should proceed, defines terminology, explains measuring instruments, and refers to useful tables and calculating machines. The second chapter treats on the methods of dealing with the data obtained, and the third elaborates the results, with a good deal of mathematical detail. The next, on "Correlated variability," is illustrated by detailed examination of actual instances, such as "eye colours," "Mendel's law of inheritance," &c. A *resumé* of "Some results of statistical biological methods of study" is given in chapter v, amongst which we notice "Seriations of wing dimensions of *Thyreus abbottii*," "Number of eye-spots on wings of *Epinephele*," "Number of spots on different species of *Papilio*," "Breadth of wing of *Strenia clathrata*," "Variation in asexually produced offspring in *Aphidae*." The references to all these instances may be found in the

**Statistical Methods, with special reference to Biological Variation.* By C. B. Davenport. Second edition, revised. London: Chapman and Hall, 1904.

appended bibliography. More than the remaining half of the book (116 out of 223pp.) is occupied by tables required for various calculations. Some of these could doubtless be found elsewhere, but it is a great convenience to have them all brought together; some are specially calculated for this work. The volume is such a collection of all that is useful and convenient to the statistical biological student, that we may reasonably describe it as indispensable.

Mr. J. B. Tomlin adds (*Ent. Mo. Mag.*) the beetle, *Silvanus mercator*, Fauvel, to the British list on the strength of specimens taken by Mr. E. A. Atmore at King's Lynn.

The Rev. E. N. Bloomfield records the capture of *Leucania faricolor* ab. *rufa* and *Whittleia retiella* at Henley, in Suffolk. The latter species is recorded as *Psyche* (*Epichnopteryx*) *retiella*, a reminiscence of the entomological dark ages.

A very pleasant social evening was spent on Saturday, February 5th, at "Delamere," South Woodford, by some of the members of the South London Entomological Society, when Mr. A. Harrison was the host. The guests arrived between 4 and 5.30 p.m., and, after tea had been served by Mrs. Harrison, an enjoyable time was passed in looking over Messrs. Harrison and Main's joint collection and splendid library. Supper was served at 7.30, among the guests present being Messrs. R. Adkin, F. Noad Clark, S. Edwards, H. Main, R. South, H. J. Turner, J. W. Tutt, W. West, etc. After supper a great many entomological matters were informally discussed.

The *28th Annual Report and Proceedings of the Lancashire and Cheshire Entomological Society* (price 2s., from the Secretary, 104, Liverpool Road, Birkdale) shows the continued activity of this society. Mr. S. J. Capper remains the president, and Mr. Sopp, the secretary, has two helpers in Messrs. Tomlin and W. D. Harrison. The annual address this year was read by Mr. R. Tait, and took the form of an interesting account of "A Lepidopterist's Work during 1904." Two papers, "The Callipers of Earwigs," and "A Preliminary List of the Orthoptera of Lancashire and Cheshire," by E. J. Burgess Sopp, are interesting, and the latter is of the greatest value as forming a basis for the study of this section of the local fauna.

BOOK NOTICE.

IGNORANCE ABOUT BRITISH BUTTERFLIES. We are thinking of publishing a new book, *A Natural History of British Butterflies*, in monthly or bi-monthly parts. To complete our knowledge of the life histories we should be thankful for descriptions, notes, material (living or dead), relating to the following points: *Pamphila sylvanus* pupa. *Thanaos tantalus* egglaying, egg. *T. actaeon* egglaying, egg. *Nisoniades tages* puparium, pupa, egglaying, egg. *Chrysophanus phlaeas* egglaying. *Callophrys rubi* egg. *Thecla w-album* larva, pupa, pupation. *T. pruni* egglaying, egg. *Zephyrus betulae* habits of larva. *Z. quercus* egglaying. *Polyommatus corydon* habits of larva, larva, pupa. *P. belargus* egglaying. *P. icarus* egglaying, etc. Any information will be thankfully received, however unimportant or small in amount it may seem. Also any county list (with authorities) for all species: Hesperid, Theclid, Chrysophanid, *Polyommatid*, Melitaeid, etc. J. W. Tutt.

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Wanted.—Correspondence with Lepidopterists and Hymenopterists in Canada, United States, and Germany, with a view to exchange of specimens and mutual help.—*J. W. H. Harrison, B.Sc., The Avenue, Birtley R.S.O., Durham, England.*

Wanted.—Ova: I wish to obtain photos of the ova of British lepidoptera. Will anyone having ova of any species, and willing to lend same, send me a list on postcard? I will undertake to return complete and undamaged as quickly as possible, and willingly pay postage.—*Alfred E. Tonge, "Ainsvoit," Reigate, Surrey.*

Wanted.—British and European Tortricids, especially those species credited to both Europe and America in Meyrick's *Handbook* and Staudinger and Rebel's *Catalog*, pinned and set in English style acceptable. Will make liberal returns in any family of North American Lepidoptera named or other orders unnamed.—*W. D. Kearfott, 114, Liberty Street, New York City, U.S.A.*

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Toynbee Hall Natural History Society.—Held at Toynbee Hall, Commercial Street, E., Mondays, at 8 p.m., April 3rd. Field Meetings: March 19th, Ongar; Fenchurch Street Station, 9.48 a.m. April 16th, Uxbridge, Shepherd's Bush (Cent. Lond. R. Station, 10.30 a.m.).

The South London Entomological and Natural History Society, Hibernia Chambers, London Bridge.—The second and fourth Thursdays in each month, at 8 p.m. March 23rd, "Our British Plume Moths," by J. W. Tutt, F.E.S. April 13th, "The Echinoderms," by W. Manger, F.E.S.; April 27th, "The Spot we stand on," by A. Sich, F.E.S.

North London Natural History Society, Hackney Technical Institute, adjoining Hackney Downs Stations, G.E.R., at 7.45 p.m. The 2nd and 4th Tuesdays in the month. March 25th, Haddenham, cycles at Tottenham High Cross, 3.15 p.m. April 8th, Wormley West End, Liverpool Street to Cheshunt, 3 p.m.; April 21st-24th, Selborne, Hants.

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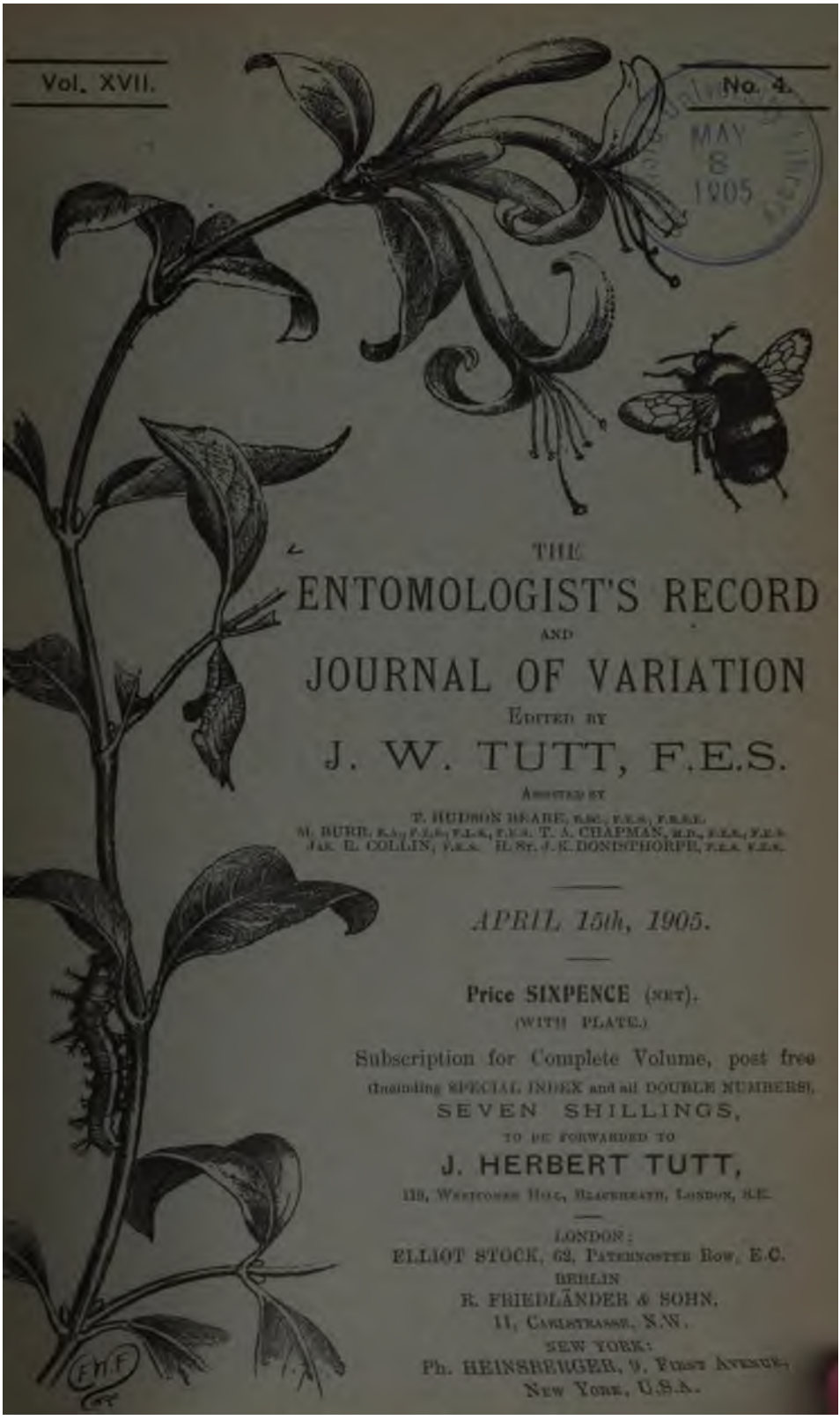

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Syntomid & Ithomiine models with their mimics from the Potaro District of British Guiana.

Transparency in wings of Lepidoptera (*with plate*).

By WILLIAM J. KAYE, F.E.S.

This is a phenomenon that has been observed somewhere or other by every lepidopterist. The bee-like hawk-moths, *Hemaris fuciformis* and *Hemaris tityus*, the *Sesiidae* or *Ægeriidae*, and, to a less extent, *Spilosoma mendica* in the ♀, will be at once recalled by every British entomologist. But no idea can be gained as to the widespread occurrence of transparency until one comes to South America. Nowhere else in the world is the phenomenon so marked or does it occur in so many families or subfamilies. It there occurs in some form or other in every butterfly family, *viz.*, *Papilionidae*, *Erycinidae*, *Satyridae*, *Nymphalidae*, *Hesperiidae*, as well as in the *Sphingidae*, *Syntomidae*, *Arctiidae*, *Geometridae*, *Zygaenidae*, *Pyralidae*, *Hypsidae*, *Castniidae*, and *Ægeriidae*. It is, however, remarkable that, so far, clear-winged bee-like *Sphingidae* are not known from the region.

In the *Sphingidae* and *Zygaenidae* one finds greater development towards transparency in other countries, notably in North America, Europe, and in India, while the *Syntomidae*, for their numbers, have developed the tendency far more in the tropics of the Eastern Hemisphere than in the West, but even though the character is less general in this family, in South America, and occurs in a smaller percentage of the forms, it is, in certain instances, far more complete than in any old world species. The general questions of transparency seem to be: (1) Why has it come about? (2) How has it come about? The first is probably far more easily answered in a general way than the second. Without doubt, transparency in many forms offers protection to those species that develop it. It may be that one species develops transparency to be like many another insect that is already transparent, and thus gains protection by entering a Müllerian association. In another, a hawk-moth assimilates a bee and a Batesian mimetic resemblance is made, the moth escaping under the guise of an unpalatable bee. Again, a Syntomid moth is like a fly or wasp, and a clear-winged Ægeriid derives the same protection.

There is probably, however, a third reason why it is beneficial for certain lepidoptera to become transparent. By losing their scales some insects could become more powerful on the wing and thus in themselves rely on more protection from birds and bats. A ridged surface, such as is presented by a scaled wing, must offer more resistance to the air than a comparatively smooth surface. In the case of the transparent Hemarine hawk-moths, probably both the rapid flight and the resemblance to a bee were caused by the simple process of losing and modifying the scales. I have already mentioned how many species have apparently become transparent so as to conform to other species that were already transparent—species that have entered a Müllerian association of transparent-winged forms—but, primarily, the models or earliest transparent members of the group must have adopted this phase for very different reasons. In certain cases, such as *Methona confusa*, in the *Ithomiinae*, the transparency has, coupled with the intense black margin and transverse bars, probably given the insect a more pronounced conspicuousness and offensive look. In other cases, such as those in the genus *Ithomia*, transparency has given them a more or less inconspicuous aspect on the wing, so that they do not convey

any particular shape or pattern, and, at a very short distance, become obliterated. Coupled with the transparency, it is to be noted that they carry the abdomen held far back into the hindwings, and thus render it doubly difficult for any enemy to deliver attack successfully. This habit of raising the abdomen has spread into almost all the Ithomiine genera, besides some Danaines and Heliconiines, where transparency has not yet been developed. In case (2), already referred to, Batesian mimics or cases of protective resemblance are extremely varied. Besides hawk-moths being like bees, Sesiids, Syntomids and Arctiids, like flies, gnats and wasps, we have Acræas, which resemble their sandy surroundings, and it becomes tolerably clear how, in the first place, the insects we term the models in a protected group assumed transparency. There are, however, certain cases which do not readily suggest an explanation. Why should a rapidly-flying Hesperiid, such as *Entheus ritreus*, be developing transparency? It is more than likely that before it became transparent it had an already extremely rapid flight, as have its completely-scaled near relatives. Again, why should the Erycinids of the genus *Zeonia* be transparent? They are extremely conspicuous when at rest on a leaf with all the wings spread out, and on the wing they are so swift that it is impossible to follow them. Has their rapid flight been accelerated by a loss of scales? Possibly it has, yet the near relatives of the genus *Diorrhina* also have a very rapid flight, and are almost completely scaled. Some members of *Diorrhina* are, however, developing a transparent tendency. It would be scarcely possible to say if one or other were the faster unless the difference be very great, but there is a possibility that a small advantage gained by the diaphanous or semi-diaphanous species is sufficient to be a help in the struggle against enemies. While it is possible to account for some cases of transparency, it is very obscure, in other cases, what could have given rise to diaphanous wings, more particularly wings that have patches only transparent, unless they are thereby made more effacive at a short distance than they otherwise would be, or are in a transition stage to complete transparency. The Syntomids, *Aggyrta micilia*, *Aggyrta dux*, or *Enagra cœlestina*, are certainly not at all inconspicuous when on the wing, and, if one of these has been a model, as one surmises, it has been one to which species might converge; but there does not appear to be any plausible argument as to why this special characteristic should have become so marked. It is probable, however, that once other species had been brought within the influence of the dominant species, whichever it was, that they, by their especial structure, could become more transparent than their model, and that what was originally a not very marked feature became developed by the action of mimicry. I utterly fail to see how Mr. A. H. Thayer's theory of effacive coloration (*Trans. Ent. Soc. Lond.*, p. 533, 1903) can apply to the brilliant coloration of *Aggyrta micilia*, which is as brilliant on the wing as in the cabinet.

To look at some other Syntomids we find the case very different. In British Guiana, *Aethria leucaspis*, *Aethria daltha* and *Sesiura smaragdina* fly together in the sunshine, their resemblance to one another being extraordinarily close, and one immediately regards them as a Mullerian group, with one or other as the dominant member, dominant by being most distasteful and most abundant. That member is undoubtedly *Aethria leucaspis*, as the proportion of each

species is about as follows: *Aethria leucaspis*, 90%; *Aethria daltha*, 4%; *Sesiura smaragdina*, 6%. But there is no difficulty in suggesting why *A. leucaspis* became transparent if it were the first of the trio so to become. The abdomen is brilliantly coloured with metallic green, and the anal segment has a tuft of crimson. If the scaling that once existed on the wings was not very conspicuous, nor of a warning nature, it probably detracted from the highly warning colour of the abdomen, but, by a nearly complete loss of scales on the wings, the abdomen has been made considerably more conspicuous, and the insect is probably rendered more immune and serves as a greater warning than it would otherwise have done. It is, of course, beyond the scope of this paper to enter into the why and wherefore of the transparency of every species, or even to all the cases of grouped transparent species where the phase was only developed by one, or perhaps two, species in the first instance, the remainder having conformed to the type. Where a large group is concerned one may be at fault in considering this or that species as the dominant or type form, when all speculative reasons as to what gave rise to transparency must be worse than useless. The chief reasons, however, that I believe to have given rise to transparency have already been laid before you, and recapitulated are these: (1) Increased conspicuousness and warning colour; (2) the reverse—greater concealment or effacement; (3) increased speed on the wing. With regard to (2) one might inquire, if effacement be the object of one transparent member of a group, why not for all? The answer is probably that, with the aid of an already transformed member, the effacive coloration will be developed very much quicker, and that mimicry must be held to have had at least a share of the influence. Moreover, if the group had attained large dimensions, any fresh arrival in the neighbourhood would be transformed to its ranks in less time than if natural selection were working on pure effacement alone.

I now pass from argument to fact and come to the second part of my paper—"How has transparency arisen?" From my own research, and from the research of others, many means have been revealed to attain this end. As to precisely how many different methods have been employed, it is not yet known. I will say at once that it was owing to Professor Poulton's valuable paper in *Trans. Linn. Soc. Lond.*, 1898, on "Natural Selection, the Cause of Mimetic Resemblance and Common Warning Colours," that I was fired to inquire into the causes that bring about transparency. In the Professor's paper a section is devoted to this phenomenon, and *Methona confusa* and *Thyridia psidii*, members of the subfamily *Ithomiinae*, are compared with *Ituna ilione* and *Ituna phenarete*, members of the subfamily *Danainae*. The microscopic examination was made on the apical area of the forewings and revealed a completely different method in the two subfamilies, and a slightly different method even between the two Ithomiines. The latter were found to have two differently-shaped lots of scales, alternating with one another, but in the transparent area the narrow scales had become hairs and the broader scales much reduced in size. In the *Danainae* only scales of one shape were present, and, in the transparent portion, the scales were simply less numerous but not altered in shape.

Following up his research the Professor examined the Pierine, *Dismorphia orise*, certain Castniids, and certain Pericopid-Hypsids, all of which fall into the transparent group, of which, doubtless, *Ituna*

ilione and *Methona confusa* already examined, are the models. In the *Dismorphia* the transparent portion shows the scales reduced in size only, the numbers not being reduced nor the shape altered. In the Hypsids, all species of the genus *Anthomyza* have the shape, numbers, and disposition of the scales the same, and transparency is effected by the scales themselves becoming transparent. In remarkable contrast with this, *Hyelosia tiresia*, also a Hypsid, shows the scales greatly reduced in number as well as being transparent, and also set up on edge to a certain extent. The last species to be examined by Professor Poulton were certain of the *Castniidae*. Several transparent species were examined, and all had the same arrangement. The scales are not reduced in size, and but little in number. The shape is simplified and the pigment is lost. The scales are also set steeply up on edge.

Several papers have been written on the pigment in lepidopterous scales, and some of these indirectly touch on transparency. Such are Mr. A. G. Mayer's "Development of the wing-scales and their pigment in butterflies and moths" (see *Museum of Comp. Zool. at Harvard Coll., Camb., U.S.A.*), and Dr. T. A. Chapman's "Notes on Mr. Mayer's paper" (*Ent. Rec.*, ix., pp. 78-79). In a paper, however, by Mr. E. W. Wake Bowell (*Ent. Rec.*, ix., pp. 271-273), on the "Scales of the European Zygænides," the shape and disposition of the scales are discussed, and the question of transparency and its development is unconsciously dealt with. I say unconsciously because of the statement that "As usual, the scales of the lower wings are less highly specialized than those of the upper." This, as I shall show later on, is the converse of what has and is taking place. Mr. Bowell finds that the trifid, bifid, or quadrifid scales of the forewing are more specialized than the strap-shaped smooth scales of the hindwing, which practically means that the forewing once had simple scales and has developed elaborate scales. One need only look at a very completely transparent hindwing covered with minute hairs to see the impossibility of such an argument. When I began to write this paper I had a vague recollection of having seen a paper on the scales of the bee-hawk moths, but a perusal of the most likely literature has failed to reveal it, so at the risk of recapitulation, I will give a few details of these interesting Sphingids.

In *Hemaris fuciformis* the scales in the transparent portion are fairly closely packed together on emergence from the pupa but have lost some of their pigment, and some are semi-transparent, but as the sockets are very weak and the scales themselves rather elevated, they quickly wear off and natural selection will probably not work any further to make the now fugitive scales themselves transparent. In all the species of *Hemaris* I have examined the same means is adopted, except that in some species notably in *H. affinis*, from North America, the scales are not nearly so elevated and, therefore, not so likely to brush off, and one might expect that the scales themselves might be more transparent, yet this does not appear to be so. In *Hemaris radians*, from Japan, the scales in the transparent area are apparently considerably more transparent, at any rate in the interspaces between the nervures, but I have been unable to examine a well-scaled specimen. In *Cephonodes hylas* the transparency of the scales has developed to a considerable extent, but I have only been able to examine specimens with a few scattered scales still left on the membrane. (*To be concluded.*)

Clay-loaded Paper and Scientific Publications.

By SELWYN IMAGE, M.A., F.E.S.

Professor Poulton, in his presidential address to the Entomological Society of London, on January 18th last, made some strong remarks upon the use of clay-loaded paper for scientific publications. The Editor of *The Record* has asked me to give him a note on the matter, which I do not willingly only but delightedly. For many a day some of us artists have been crying out against the use of these papers for anything but the most ephemeral purposes. It is a great encouragement that here at last is science joining art in her outcry. Perhaps somebody now will begin to listen.

Professor Poulton minces no words, and I cannot do better than quote a few of them. "I refer especially," he says, "'to the so-called art papers.' Their opaque, white, polished surfaces, which yield the most successful 'half-tone' and 'three-colour' printings, are at present only possible by means of a veneer of china clay. Dust it is, and we, are assured by experts that not many years will pass before it succumbs to the fate, which the highest authority tells us is in store for dust . . . . Every Fellow of this Society will agree that an age producing scientific records, which cannot be made to endure, is an age to be rightly scorned by the generations of the future . . . . This is a matter so important that it ought not to be left to the President of your Society to sound the warning. It is a matter which it would have been well if the Royal Society and the British Association had taken up years ago . . . . I know no producer, scientific or other, whose self-respect would suffer the employment of materials, however good the effect, however low the cost, which would not last say five-and-twenty years."

Now five-and-twenty years is a time appallingly short. Professor Poulton says that he is speaking on the authority of experts. From one point of view I most ardently hope that his experts are accurate to the letter. To any one who knows what the qualities of good paper are, these loaded papers are hideous to the eye and unpleasant to the touch; so that, whether they will last or will not last, one would rejoice to see them swept out of the land. If the Professor's time limit is right, some of us will fortunately live to see them swept out of it. But here I must be honest and confess that I, too, for the purposes of this note, have been to an expert—one of the first in London—and that I have come away from him not quite so jubilant as I had hoped. No pressure of mine could bring my friend to assert that there was evidence that these papers would in time drop to dust *for a certainty*. But the chances that they would were, he was prepared to say, very great. Well, and if at the moment we can see our way to going no further than my cautious friend will go, is that not far enough? Is anybody, for serious work, not meant for the passing hour, content to sit quiet and run such a risk?

But further. These loaded papers are forced upon us mainly in support of half-tone blocks and the three-colour process. Half-tone blocks, we are told, cannot be printed satisfactorily on any other than loaded paper. Undoubtedly this is true. If anybody can invent a good non-loaded paper upon which they can be printed, he may rely upon a fortune in a week. But the obvious answer is, why use half-

tone blocks at all for serious and permanent work, seeing that the risk is, at the least, so great? These half-tone blocks in their results are not really such superlatively fine things that we must have them at any cost. For scientific illustrations they are at any rate not better than carefully executed line process-blocks, which can be printed on any reasonable paper. As I write, the second volume of Dr. August Weismann's *The Evolution Theory* lies open before me at page 246. Will it be maintained that the line process-block illustration on this page, of galls on a twig and a leaf, is an inferior thing to the half-tone block of the crustacean on page 242? From an artistic point of view it most assuredly is not; and I venture to say that, from a scientific point of view, everything that could be required for accuracy or charm in the crustacean could be given by a fine drawing made for the line process-block.*

But how does the matter stand in regard to the three-colour process? If it is stated that illustrations in this method *cannot* be printed on any but clay-loaded paper, the statement is exaggerated. They can be printed on such paper most easily, and, unless special care be taken, most effectively; that is all. When everything is said and done, however, so far as colour goes colotypes are a great deal better than three-colour-process illustrations. Yes, it may be replied, but how much more expensive! That depends. Certainly up to 500, possibly up to 1000, the difference in price between the two methods for monochrome illustrations would be infinitesimal, and for coloured ones would not be prohibitive. The cheapness of the three-colour process comes in when you run into many thousands; and for the best kind of scientific works there is not, alas! this demand. Moreover, the cry for cheapness is not the only cry worth heeding, and if your work, as Professor Poulton says, is going shortly to perish, or, as my cautious expert friend says, is very probably going to perish, a wise man will think twice before he welcomes even cheapness at such a risk.

Only one word more. I have alluded to Dr. Weismann's book on evolution, recently published by Mr. Edward Arnold. It is a work of the highest importance, but it is no easy matter reading it. You want everything to help you in reading it, that your attention may be undivided. What actually happens? You take one of the volumes in your hand, and every few minutes you have to shift it about or to put it down, so vilely does its weight make you ache. And the reason of this weight lies in the fact that it is printed throughout on clay-loaded paper. And the reason of its being so printed is that some of the illustrations up and down it may be half tone blocks. I say frankly that these illustrations could have been done by another process just as well; and that the annoyance and inconvenience caused by this half-tone process in a book of this importance, we ought never to be called upon to put up with.

* Perhaps even a more obvious instance is on page 178, where the larva of *Sesia stellatarum* is a half-tone, and that of *Smerinthus ocellatus* a line process-block.

The Basses-Alpes and Hautes-Alpes in July (*with plate*).

By W. G. SHELDON.

(*Concluded from* p. 67.)

On July 17th, we left Digne for that portion of the Hautes-Alpes

around the valley of the river Guil; Mr. Tutt has given an account of the district in August, see *Ent. Record*, vol. xii., pp. 226-229; 258-262; 318-320. The scenery in this valley is very grand, amongst the best in the Alps that I have seen, and the collecting good, especially for the higher mountain species. Our experience in the diligence, down the Gorge of Queyras, was an exciting one, for the Jehu, thanks to a skin full of wine, was in fine form; the road, which in places is very steep, turns here and there almost at right angles, with absolutely no protection but a low parapet to prevent a flying leap into the limpid waters of the Guil, many hundreds of feet below. Our feelings as the lumbering diligence madly raced down the slopes towards these bends, were vivid, for the slightest stumble of one of the horses would have meant the end of all things so far as we were concerned, and we had noticed before starting that each of the three horses bore unmistakeable evidences that they were no strangers to a tumble; however, we eventually arrived in safety at the bottom, but future travellers might do worse than to critically examine the driver at Guillestre before starting, and, if evidences of hilarity are discernible, to take a private carriage. We settled for three days at the comfortable little Hotel "Puy Cot," under the walls of the grand old fortress of Chateau Queyras; Baedeker is silent respecting the past of this old Chateau, but it played an important part in the religious wars with the Vaudois, and is now the depôt of a battalion of "Chasseurs des Alpes," whose "reveille" regularly woke us up at 2 o'clock a.m. The village and Chateau of Queyras are very picturesquely situated in the centre of the valley of the Guil, at an altitude of about 4500ft.; on each side of them the mountains rise very steeply for a further height of 4000 or 5000ft. I do not think the district has been worked for Rhopalocera, except during August by Mr. Tutt, and we expected to get new experience. Perhaps the most unexpected species observed was *Euchloë euphenoides*, fairly abundant, generally distributed, and not in bad condition; this in the middle of July; one example I netted at an elevation of at least 5500ft. Then again *Coenonympha dorus* was a common and widely distributed species; I do not think it has previously been recorded from the Hautes-Alpes.

Down the valley towards Guillestre, and on the lower slopes, there is fair collecting, specimens in swarms, but of comparatively few species. Here *Erebia ligea* was in hundreds, *E. euryale* in thousands, each species typical in form, and flying on the same slopes; one wonders where, under these conditions, the supposed identity of the two as species comes in? *Brenthis ino* in fair numbers, was observed for the first time; much more numerous was *B. amathusia*; *Parnassius apollo*, typical here; *Thecla spini* very fine, sucking at the thyme blossoms; and plenty of *Melitaea didyma*, with less worn females than at Digne. *Polyommatus damon* drinking at the puddles, all males, just emerging. An odd male *Erebia neoridas* was evidently the forerunner of the hosts that would fly later on. The mountain-tops, however, afford evidently the best collecting; one can go up by the zigzags immediately behind the hotel, but much better is to cross the river, and proceed by the military road to the tops of the "Sommet Bucher"; the gradients here are easy, and one can net on fairly level ground, a decided advantage when a man is on the wrong side of forty. After climbing 2000ft. or so, we get above the larches, and

the high mountain species at once appear. Amongst them was *Colias phicomone*, literally in tens of thousands, the males somewhat flown, the females in prime condition; *Erebia tyndarus* was in its customary abundance, flying with *Coenonympha iphis* and *Polyommatus eros*, and, on the summit of a knoll, a great number of *Melitaea cynthia* were flitting about, of both sexes. Unfortunately they had been on the wing some time, and I only succeeded in obtaining less than a dozen good ones.

We took the diligence again for Abries on July 19th, where we had intended to stay at least a week. Unfortunately, on our first ascent, we all drank from a cattle trampled stream, which imprudence effectually put an end to our mountain climbing during the remainder of our sojourn. Memorandum in future, when dependent on streams for quenching thirst, always take a pocket filter. On this ascent in question, to the "Pointe de la Lauze," wisely recommended by Mr. Tutt, we had a good time, though the lower slopes, until we got above the larches, were not prolific. A certain number of *Erebia euryale*, a few *Chrysophanus virgaureae*, *Erebia goante*, *E. tyndarus*, etc., were all that were observed; the scarcity of species and examples being caused by half the cows belonging to the village grazing on these slopes. When, however, we had climbed a couple of thousand feet, we came to a valley with a stream flowing down from the higher peaks. Here *Parnassius delius* was flying in some numbers, the only specimens seen in the district, and with them an enormous form of *Pieris napi*—one measuring 56 millimètres in expanse. At the damp places, drinking, were plenty of *Polyommatus orbitulus* and *P. eros*, of which latter species Mr. Abbott was fortunate in netting two examples of the rarely met with female. Following the stream up another thousand feet, the valley narrowed to a steep ravine, here *Erebia goante* was abundant, males only, and for the first time I captured *Polyommatus donzelii*, and also two good specimens of *P. pheretes*, which species I have always found rare. Still another thousand feet upwards, and we were on the ridge; here on the screes Erebias were flying in numbers, they proved to be *E. gorge* and *E. glacialis*, all the males of which were var. *pluto*. Here also my son netted a fine specimen of *Brenthis ino*, at a height of considerably over 9000ft., evidently blown up from the valley below.

After this we had two days' collecting round the hotel, but did not find the low levels very productive in desirable species. There were plenty of *Coenonympha iphis*, *Carcharodus lavateras*, *Polyommatus damon*, *P. escheri*, *Erebia goante*, *E. euryale*, and *E. stygne*, and I was much pleased to obtain a nice series of *Melitaea parthenie*, all the specimens I had previously supposed were this species having turned out to be *M. athalia*. *M. parthenie* is very easily recognised, when you know it, the snuff-coloured nose being unmistakeable.

We also took a few of the interesting local form of *Parnassius apollo*, with red spots on the upper sides of the superiors, as in *P. delius*, from which it is, however, distinguishable by its more pronounced dark shading, by the absence of the cream ground-colour, and by the antennæ. I suppose from ten to twenty per cent. of those taken would be this form. The ill-effects of drinking bad water continuing, compelled us to leave this delightful valley before the appointed time, for doctors do not dwell there, and, accordingly, on July 24th, we journeyed north again.

In travelling to and fro between Grenoble and Veynes, I suppose most of us look longingly at the country passed, the magnificent prospect, one of the finest and most extensive, I suppose, in Europe, of the Dauphiné alps, with scores of peaks in the east, the extraordinary shaped Mont Aiguille in the west; the wealth of insect life one sees from the train, and the promising collecting-ground all around, at all levels, makes one's mouth water. These prospective advantages, with that of the town of Grenoble, within easy reach for medical assistance, induced us to essay our luck there, and, on consulting Baedeker, we found he recommended a small hotel at "Clelles-mens," some thirty miles from Grenoble, and situated on a breezy mountain side, some 3000ft. in altitude. Here we stayed very comfortably for a week. The Hotel Ferrat, though very primitive, we found clean and comfortable, Madame most obliging, the food provided more to our liking than was our experience elsewhere in the French Alps, with an entire absence of garlic, which was pleasing, to say the least of it; whilst the *pension* reminded one of a certain Scotch friend, who once informed me that a visitor to his native land could live on nothing, if he knew his way about. I have not found this to be my lot, by any means, when sojourning in the land of oat-cakes and whisky, but suppose I have failed through not knowing my way about; but I should certainly recommend this little hotel at Clelles to anyone who wishes to study economy.

Most of our collecting was done at the level of the Hotel, Satyrids were to the fore, the most abundant species of which was undoubtedly the lively and handsome *Hipparchia briseis*, which was in dozens on every piece of rough ground, in splendid condition, and with it plenty of *Satyrus alcyone*, *Hipparchia semele*, and *H. arethusa*. The Erebias consisted of *Erebia neoridas*, just coming out, with only occasional females; and *E. blandina*, abundant; swarms of *Polyommatus damon*, and *P. corydon* were everywhere; *Papilio machaon*, not infrequent, but swift-winged and hard to capture; *Parnassius apollo*, including one or two of the red-spotted form met with at Abries, evidently this is widely distributed; *Pontia daplidice*, just emerging and fine; *Colias hyale*, large and numerous, with an abundance of females; *C. edusa*, scarce; *C. phicomone*, one specimen, probably abundant two or three thousand feet higher up in the mountains; *Chrysophanus virgaureae*, getting worn; *Limenitis camilla*, not common and *passé*: *Euvanessa antiopa*, one example only; *Militaea phoebe*, infrequent; *M. didyma*, abundant, females, the plains form; *A. parthenie*, frequent; *Argynnis niobe* var. *eris*, *A. adippe*, *A. aglaia*, and *Dryas paphia*, a number of examples of each; *Melanargia galatea*, common and typical; the *Epinephele jurtina* were of the *hispulla* form, but not as pronounced as those from Digne. From Clelles we journeyed direct for England.

The general impression one gets of collecting in the south of France is, that, apart from certain groups, such as the Satyrids, it is not quite so prolific in species, or examples, as Switzerland, in July; no doubt the much drier climate is accountable for this, the low levels being dried up, and many of the mountains stony and bare. The great drawback is the hotels, these are in most cases very poor, so far as the character of the food provided is concerned, though there are of course exceptions, and one gets a certain amount of garlic with each meal, which is not exactly to English tastes.

To the visitor to Digne, in July, I would especially commend the fruit obtainable there; large luscious peaches, to be purchased at the rate of ten a penny, and delicious water melons, almost equally cheap. We usually took with us on our day's excursion a large bag of peaches and a melon, leaving them to keep cool in a spring where we lunched, and we found it a great consolation to visit that spring, after an hour or two in the sun.

Synopsis of the Orthoptera of Western Europe.

By MALCOLM BURR, B.A., F.L.S., F.Z.S., F.E.S.

(*Continued from* vol. xvii., p. 64.)

Genus IX: STAURODERUS, Bolivar.

This comprises Brunner's groups 2 and 4, and is defined and classified by Bolivar.

TABLE OF SPECIES.

1. Ulnar veins of elytra only separate at base, fused in rest of elytra.
   2. Large. (20mm. ♂, 27mm. ♀.) Wings dark. .. 1. MORIO, Fabr.
   2.2. Smaller. (14mm. ♂, 20mm. ♀.) Wings hyaline. .. .. 2. APRICARIUS, L.
1.1. Ulnar veins diverging from the base.
   2. Typical sulcus of pronotum behind the middle.
      3. Posterior tibiæ red; posterior femora with greyish bands more or less distinct, or with dark spots, rarely unicolorous, in one species in which the elytra and wings are very short.
         4. Larger. Elytra and wings well developed in both sexes, reaching at least to end of abdomen, rarely somewhat shorter in the ♀.
            5. Elytra surpassing abdomen, of uniform colour with a single white spot about two-thirds the length; posterior tibiæ with a pale ring near the base; colour greenish; size large. (16mm.-20mm. ♂, 22mm.-27mm. ♀.) .. 3. BINOTATUS, Charp.
            5.5. Elytra not longer than abdomen, sometimes a little shorter in the ♀; former with a series of black spots along discoidal area, and an anteapical white spot; hinder tibiæ blackish beneath at apex; colour grey, more or less reddish; size smaller. (16mm. ♂, 20mm.-23mm. ♀.) .. .. .. 4. SAULCYI, Krauss.
         4.4. Smaller (13mm. ♂, 19mm. ♀). Elytra and wings hardly covering abdomen in ♂, exposing half in ♀; with scapular area of ♂ much dilated.
            5. Discoidal area of elytra spotted with black; knees paler; (typical sulcus in middle). Spanish species. .. .. 5. CAZURROI, Bolivar.
            5.5. Discoidal area unspotted; knees black; (typical sulcus behind middle). East European species. .. .. 6. PULLUS, Phil.

3.3. Posterior tibiæ yellow or bluish; posterior femora with no grey bands, only with irregular spots of this colour; elytra and wings well developed, longer than abdomen.

4. Large (15mm.-19mm. ♂, 21mm.-27mm. ♀). Colour yellowish-green, with apex of abdomen of ♂ red above; scapular area of elytra with a long white stripe; wings hyaline, with apex darker .. .. 7. APICALIS, Herr.-Sch.

4.4. Size smaller (13mm.-15mm. ♂, 20mm.-22mm. ♀). Colour pale yellowish, ochraceous, generally with greyish spots; the apex of abdomen of the general colour, or very faintly reddish, and elytra of ♀ with no white band; wings dark or hyaline .. .. 8. VAGANS, Fieb.

2.2. Typical sulcus of pronotum in middle or before middle.

3. Elytra of ♂ very broad, with fore border strongly bowed by dilation of scapular area; this and the radial area strongly dilated, brilliant and transparent, the 1st and 2nd radial veins flexuose; in ♀, elytra narrower, anterior border arched, and scapular area slightly broadened .. 9. BIGUTTULUS, L.

3.3. Elytra of ♂ but slightly broadened, anterior border but slightly arched; scapular area slightly, and radial area not at all, dilated, the 1st radial veins very straight; ♀ elytra narrow, anterior border almost straight, scapular area not dilated .. .. 10. BICOLOR, Charp.

1. STAURODERUS MORIO, Fabricius (=*melanopterus*, Borck).

Large, dark olive; elytra dark, different in the two sexes; in ♂, fore border strongly arched, mediastinal vein strong, bent, scapular and discoidal areas very broad, with parallel straight transverse veinlets; ulnar veins united, very straight; elytra of ♀ broad, but anterior border not so bowed; mediastinal area as in ♂, but scapular and discoidal areas not dilated, irregularly reticulated; wings smoky, nearly black, the mediastinal and radial veins thickened, strong, the former curved, forming with the latter a regular bright shining area; hind femora olive; tibiæ red. Length of body, 19mm. ♂; 23mm. ♀; of pronotum, 4·2mm. ♂, 5mm. ♀; of elytra, 18mm.-19mm. ♂, 18mm. ♀.

A large species, conspicuous by its size, dark colour, smoky veins, and clattering stridulation, resembling the winding of a watch, when chirping at rest, and clattering noise when flying.

Widely distributed in the mountains of central Europe. In France it occurs at Larche, Savoy, Barèges, Cauterets, Mont Dore, Gavarnie, Canigou, Bagnères de Luchon, Chartreuse, Serre, and many other localities in the Pyrenees and Alps. In Spain, it is found in the mountains of the north and centre, La Granja, Guadarrama, Cuenca, Oña, Panticosa, Peñalara, Collsacabra, Cambron, Salto, Jaca, Montseny. It is found also throughout Switzerland, and on the Italian slopes of the Alps; in North Germany, and Sweden, as well as in Austria, in the Tirol; it is common round Innsbruck.

2. STAURODERUS APRICARIUS, L.

This is a pale form of the preceding, from which it differs in its lighter colour, hyaline wings and somewhat slenderer build; it is distinguished from other species by the form of the ulnar veins, and by the thickened veins of the wings and undulated fore border of the wings. Length of body, 16mm. ♂, 18mm.-22mm. ♀; of pronotum 8·1mm. ♂, 4mm. ♀; of elytra 12mm. ♂, 11mm.-13mm. ♀.

Occurs in mountains in northern and central Europe. In France it is said to be numerous at Mont Dore, and is recorded from the Canigou under the name of *S. finoti*, Saulcy, also recorded from Le Col d'Assos, in the Basses-Alpes, and Vernet-sur-Sioule. In Spain it has been taken at Lugo, Panticosa, and at Nuria. It occurs also in Germany, but not in Belgium, nor south of the Alps. In Sweden, it is recorded from Skåne, Oeland, and Borgholm; in Lower Austria, on the Bisam and Leopoldsberg, Ottakring, Mauer, Rodaun, Mödling, Baden, and Kranichberg.

3. STAURODERUS BINOTATUS, Charpentier.

Variable in colour, but recognisable by the uniform grey elytra, with a white, indistinct stigma, and by the very noticeable grey bands on the posterior femora; the colour of the hind tibiæ, bright red, with a yellow ring at the base, is also characteristic. Length of body, 17mm. ♂, 26mm. ♀; of pronotum, 3·3mm. ♂, 5·6mm. ♀; of elytra, 12mm. ♂, 21mm. ♀.

This is a locally distributed species, occurring in clearings in woods, on heather or among reeds. It is rare in France; Mont de Marfan, Poissy, Arcachon, La Teste-de-Buch, Lamothe, Amélie-les-Bains, Tarbes, Canigou, and Aigremont. In Spain, in the Sierra de Peñalara, Escorial, Ferrol, Bilbao, Chiclana, and Uclès; it is found also in Portugal.

4. STAURODERUS SAULCYI, Krauss.

Elytra not extending beyond abdomen; allied to preceding, but differs in the colour of the hind tibiæ (*vide* table), and the smaller size, slenderer form. Length of body, 21mm. ♂, 22mm.-23mm. ♀; of pronotum, 4mm. ♂, 5mm. ♀; of elytra, 14mm. ♂, 15mm. ♀.

This is a somewhat rare and little known species, considered by Finot to be a mountain form of the last. In France it has been taken at Pla-Guilhem, at about 230 mètres, on the south-west of Canigou, near Vernet-les-Bains in the Eastern Pyrenees. In Spain it appears to occur down the coast from the Pyrenees to Barcelona.

The variety *daimei*, Azam, has shorter elytra than the type, which hardly surpass half the length of the abdomen in the ♀ and scarcely reach the extremity in the ♂; it has been taken by Azam in the Basses-Alpes, and in Spain at Berga.

5. STAURODERUS CAZURROI, Bolivar.

Closely related to the preceding; distinguished by the typical sulcus being placed somewhat nearer the fore border of pronotum, by the black spots on the discoidal area of elytra, and by the pale knees, and lastly, its habitat. Length of body, 15mm. ♂, 20mm. ♀; of pronotum, 3mm. ♂ and ♀; of elytra, 8·5mm. ♂ and ♀.

Apparently confined to the Picos de Europa, in the province of Santander, where it is found on the grassy uplands about 5000ft.

6. STAURODERUS PULLUS, Philippi.

Small; darkish testaceous, with black spots; antennæ comparatively short; elytra not spotted, barely reaching apex of abdomen in ♂, not surpassing the 5th segment in the ♀; elytra dilated strongly in ♂, the scapular area especially, and the anal area also dilated; in the ♀ the scapular area is not dilated; wings much shorter than elytra, smoky; knees black; hinder tibiæ dirty reddish. Length of body, 13mm. ♂, 19mm. ♀; of pronotum, 3mm. ♂, 3mm.-8mm. ♀; of elytra, 9mm.-10mm. ♂, 8mm.-17mm. ♀.

A variety with fully-developed organs of flight is very rare.

North Germany, the Harz Mountains, Berlin, Jungfernhaide, Saxony, Saxon Switzerland, Dresdner-Haide, Hohenweise, Leuthen. In Central Germany at Regensburg. In the Alps at Domleschg, and the Tirol at Innsbruck; also in Carinthia. In eastern Europe it occurs in Austria, at Vienna, in Galicia, Transsylvania, Kasan, and Tiflis.

The fully-winged form has been taken in Saxon Switzerland.

(To be continued.)

ORTHOPTERA.

OBSERVATIONS ON THE PAIRING OF GRASSHOPPERS.—On August 19th, 1901, at about 10 a.m., whilst at Au Pra, I observed on the grassy slopes of the mountain at the back of the Albergo delle Alpi, a very great number of the finely coloured, striped-legged, red-shanked grasshopper, so common in many of the Alpine districts. They were stridulating very loudly, and it was difficult, owing to their great abundance, to understand why any stridulation was necessary for the attraction of the sexes to each other. It was obviously apparent, however, that stridulation was for this purpose, and one pair, watched for quite a quarter of an hour, were seen to approach each other across a piece of herbage-covered ground, about three yards in length. When they had discovered each other the male immediately jumped on the back of the female, but she seemed to reject his advances, and it was not until the sixth attempt that pairing was effected. Next day, on the 20th, at about noon, a great number of the generally considered rare small green grasshoppers, *Podisma pedemontanum*, Br., with a black line on either side, and red hind legs, were observed on a grassy slope, at some little elevation above the road, and to the right, directly one had passed the frontier stone on the Col de la Croix, going from Italy into France. The insects were exceedingly active, and several pairs were discovered *in copulâ*. The male is much smaller than the female, and, whilst paired, he clasps the ♀ firmly with the front pair of legs, directly in front of her first pair of legs (his right in the incision between the pro- and mesothorax, the left between the head and prothorax), the second pair clasping firmly under her third pair, whilst his third pair were drawn up by the sides of his abdomen, which was bent over to the right side of the female, the last four abdominal segments being curved round beneath the venter of the terminal segments of the ♀, and the last two abdominal segments bent upwards from beneath for copulation. The male appears to remain perfectly motionless, and was not disturbed by the movements of the ♀, who was somewhat excited by the close quarters of the glass-topped box, in which they repeatedly fell from the top to the bottom. When disturbed the male

rigidly moves the femora of the hindlegs to right and left, the body being swayed in the same direction. The pair under observation remained paired all night, separating next morning between 6 a.m. and 6.30 a.m.—J. W. TUTT.

NOTES ON LIFE-HISTORIES, LARVÆ, &c.

ORGYIA ANTIQUA, VARIATION OF LARVÆ AND COLOURING OF PUPÆ.—It is a rare pleasure to me to be able to tell my friend Dr. Chapman something about entomology that he does not know, and, therefore, I am glad to be able to supply some of the information he asks for in a recent number of the *Record*. I happen to have had a large number of larvæ of this species, from English eggs, in 1901. As to the lateral tufts, Stainton in his *Manual* describes them as "a slender lateral tuft on each of the 5th and 6th segments." Newman (*British Moths*) does not mention the lateral tufts; nor does Barrett, whose plate does not show them. Hoffmann shows them in his plate and mentions them in his description. I see my note of 1901 is as follows:—"Lateral tufts: In the great majority of cases the anterior ones whitish, the posterior blackish; in many the anterior are wanting or slight; the hairs of these whitish ones are plumose, but not tufted like the blackish ones on the 2nd and 12th segments or the posterior lateral ones, and these lateral ones are less tufted than those on the 2nd and 12th segments." Further notes are to the effect that the colour of the four dense dorsal tufts showed the following variation:—(*a*) white; (*b*) cream-coloured; (*c*) yellow; (*d*) coffee-coloured; (*e*) two anterior coffee-coloured, two posterior white or yellowish; also that the general colouring was usually slaty-grey, and, when the dorsal tufts, or two of them, are dark (coffee-coloured) the ground colour is also darker, in fact, blackish-grey, especially on the back; the red dorsal tubercles on the 11th segment are retractile, and shrink when they, or sometimes when any parts of the body, are touched. These notes were made July 20th. As the larvæ with dorsal tufts of different colours, referred to above as (*e*), were mostly young, I set apart thirteen of these, and, on July 28th, found a considerable change; five had died, and, of the remaining eight, only two preserved their differentiation of colour; of the other six, four had all the four dorsal tufts coffee-coloured, and two had them all whitish. Dr. Chapman asks whether English *antiqua* pupæ are always black. On this point also I have some rather full notes, from which it appears that I classified my pupæ, of which I had 158, as follows:—pale, 67; intermediate, 38; dark, 53. All were more or less blackish down the back, and most had whitish or greenish-white colouring ventrally. Of the "pale" ones, in extreme cases, the dorsal blackish-brown was limited to a very small part of the first three segments behind the head and to the posterior overlapping edges of the other segments, the colouring there being widest on the back and tapering towards the sides, the spiracles being always coloured, the ventral aspect greenish-white or whitish with a transverse row of blackish-brown spots, scarcely visible, just below the wings, and some few brownish markings about the mouth-parts and the anal extremity; the males in all cases having the dark markings more widely spread than the females. The "dark" ones were very different in appearance; in extreme cases, dorsal and ventral aspects in the males

uniformly black, except for three whitish dorsal tubercles; and the females uniformly black, except that they were slightly whitish towards the sides.—F. MERRIFIELD, F.E.S., 24, Vernon Terrace, Brighton. *December 30th*, 1904.

VARIATION IN LARVÆ OF ABRAXAS GROSSULARIATA AND ARGYNNIS AGLAIA.—The black larvæ of *Abraxas grossulariata*, mentioned by Dr. Riding (*anteà*, xvi., p. 295), are exceedingly abundant here, about six miles south of Newcastle. They occur along with the type-form in the same gardens. An exceedingly beautiful intermediate form occurs, in which only the red of the normal larvæ and the black occur. Another intermediate form also occurs, in which the main colouring is black, but an interrupted subdorsal line is seen, consisting of white dashes. These usually only produce typical imagines, but larvæ of the black form from one garden here tend to produce imagines with the left forewing considerably blacker than the right. I bred one specimen this year with a broad black band along the costa of the left wing. Two years ago I sent some of these black larvæ to a friend in Italy, and he bred, in April, some half-dozen black imagines. (Is this a clue to the production of the dark aberrations?) I noted with interest Dr. Chapman's note upon the black larvæ of *Argynnis aglaia*, found by him in Spain. Here we get the larvæ of *A. aglaia* in some abundance. In fact, in 1902, we got some 60 larvæ. The noteworthy feature about them was that, with the exception of the red dots upon the spiracular line, they were jet black. We looked in vain at each instar for the bright yellow lines, figured and described in the usual text-books upon the lepidoptera, for they never appeared. My larvæ produced typical males, but the females were considerably lighter than usual. The imagines expanded upon the average two-thirds the size of a series I have from Sussex. This may have been due to being reared in captivity, but would otherwise only be in keeping with our usual experience here in the size of the imagines of other insects.—J. W. H. HARRISON, B.Sc., The Avenue, Birtley, R.S.O., Durham. *November 27th*, 1904.

EGGS OF LEPIDOPTERA.—*Orthosia macilenta*.—Eggs laid October 22nd on the bark of beech, and, in captivity, on sides of chip box. They are laid in small batches of from one to ten. *General shape:* Almost spherical, but so very much flattened at the base that they form not much more than *half* a sphere. Length : breadth : : 4 : 2¼. *General colour:* Beautiful iridescent cream when laid, with whiter and brighter concave pits; changing to a deep chocolate about October 28th (six days later). *Special markings:* At the equator there are about 30 to 33 longitudinal ribs raised very prominently, and zigzagging to meet the transverse ribs. These latter are less prominently raised; but where the longitudinal and transverse ribs meet there is a special increase in the amount raised, so that the pits between the ribs, instead of being well-marked hexagons, are almost circular. The longitudinal ribs running up to the micropyle unite in twos and fours alternately, so that at the edge of the micropylar area they are only ten or eleven in number. Each of these ten or eleven hits a petal-shaped depression (ten or eleven in number). These depressions, looked at from above, very much resemble the petals of a flower. The micropyle itself is *slightly* raised from this stellate depression, and is considerably darker than the general colour. It consists of a ring of from ten to twelve pear-shaped pits (I had three

ova in the field of the microscope at the same time which had ten, eleven, and twelve pits respectively). These pear-shaped pits have their narrow ends produced towards the centre of the micropyle, which appears thickly irrorated with black spots.—(Rev.) R. FREEMAN, M.A., Prescot, Lancs.

COMPARISON OF EGGS OF ANCHOCELIS LITURA, A. PISTACINA, A. HELVOLA, ORTHOSIA MACILENTA, MELLINIA CIRCELLARIS. — Size: *A. litura* slightly less than *O. macilenta*, which = *A. pistacina* = ⅞ *M. circellaris* = ½ *A. helvola*.

A. litura: Fifty to 60 ribs; transverse ribs almost invisible even under very high power. All the ribs very faint. Stellate area too complex to describe. Micropyle so badly formed as almost impossible to describe (very small). Length : height : : 4 : 3¾, flattened slightly at base and at top; size distinctly less than in *O. macilenta*. Colour: Cream all through.

A. pistacina: 40 to 50 ribs, transverse ribs faintly visible, more so than *litura*, less than *macilenta*. Stellate area less complex and irregular than *litura*, but far from as perfect as *macilenta* (traces of more petals than in *macilenta*). Not perceptibly depressed. Micropyle, 12 pear-shaped depressions (same number as *macilenta*) but very much smaller and fainter micropyle than *macilenta*. Not perceptibly funnel-shaped. (Main vertical ribs are not really zigzag as in *macilenta*, only slightly thickened where the transverse ribs join). Length: height : : 4 : 3⅞. Scarcely flattened at base. In my opinion this egg shows a less developed (more elementary) form than *macilenta*. Almost equal to *macilenta* in size. Colour yellow, but larva shows the deep brown.

O. macilenta: 30 to 33 ribs, transverse ribs broad and plainly marked, almost as elevated as the main longitudinal ribs. Stellate area beautifully perfect, 10 petals, each oval spoon-shaped, no trace of a central rib passing through the petal as in *circellaris*. Perceptibly depressed as in *circellaris*, but not so much as in *helvola*. Micropyle 12, rarely 11 or 10, pear-shaped depressions. Micropyle considerably larger (proportionately to general size of egg) than in *pistacina*, but considerably smaller than in *circellaris*. Just perceptibly funnel-shaped. Main vertical ribs zigzag conspicuously, and transverse ribs together with vertical ribs form a distinct honeycomb appearance. Length is to height : : 4 : 2¾, very much depressed at base. Colour chocolate.

M. circellaris: Very like *macilenta*, but, in my opinion, more highly developed; larger egg, almost half as big again as *macilenta*. 27 to 30 ribs (distinctly less than in *macilenta*, despite larger size). This, together with the sharper edge of the ribs, give a more open appearance to the egg. Stellate area very beautiful; 12 petals, each bisected by a continuation of the rib, which continuation *sinks* in the middle of the petal and rises again towards the micropyle. Micropyle, 10 pear-shaped depressions—notice this is the reverse of *macilenta*, which has stellate area 10 petals, micropyle usually 12 pear-shaped depressions (rarely 11 or 10). *M. circellaris* has stellate area 12 petals, micropyle usually 10.

In all the eggs sent and examined (eight or nine in number) there was no variation in micropyle, which always had 10 pear-shaped depressions. Size half as big again as *macilenta*. Length : height : : 4 : 3 (considerably nearer a sphere than *macilenta*). Micropyle much larger, proportionately, than *macilenta*; more funnel-shaped, and more raised from the depressed stellate area. Colour green inside, mother-of-pearl covering.

A. helvola: In my opinion this egg is *absolutely* different from *macilenta*, *pistacina*, and *circellaris*. It is twice the size of *macilenta*. 35 ribs, absolutely straight, very sharply raised, more so than *circellaris*. Stellate area all but absent (or else (?) vertical on sides of micropyle); main ribs dip a great deal at this spot, but rise again and run straight on to micropyle. Cross ribs very weak, straight, low, more like the roof of a house than ribs. Micropyle very much raised and *very very* small compared with *macilenta*. But in spite of its small size the micropyle has 20 (! !) pear-shaped depressions, which run in a far steeper funnel to the centre. Length almost equal height : : 4 : $3\frac{15}{16}$. Colour yellow inside, mottled with red towards shell, specially top half.

Summary.—The egg of *A. pistacina* is like, but far more degraded than, *O. macilenta*. *M. circellaris* is like, but slightly more specialised than, *O. macilenta*. That of *A. litura* seems a very elementary form. *A. helvola* seems of quite a distinct class.

DIFFERENCES.

	LITURA.	PISTACINA.	MACILENTA.	CIRCELLARIS.	HELVOLA.
Size	·3m.	·4m.	·4m.	·6m.	·8m.
Ribs	50 to 60, faint	40 to 50, irregular	30 to 33, very regular, thick, and zigzag	27 to 30, still more regular and sharper	35, quite straight and very sharp
Transverse..	hardly visible	just visible	very much marked and equally raised	not so prominent, distinctly lower	like ridge of roof
Stellate area	hardly visible	just visible	beautiful spoons	beautiful spoons and mid-rib	hardly visible
Micropyle ..	(v. small) ??	(small) 12 pear-shaped depressions	(small) 12, rarely 11, 10	always 10 (large)	20 (v. small)
Colour	cream	deep brown	chocolate	green	yellow, mottled with red

(Rev.) R. FREEMAN, M.A., Prescot, Lancashire.

EGGS OF LEPIDOPTERA.—*Callophrys rubi.*—The egg is roughly circular in outline and spheroidal in shape, being depressed or flattened at both poles; the surface covered with a rather coarse network that is roughly polygonal, the polygons having from five to nine sides, although the greater number are hexagonal. The micropylar area forms a comparatively large depression at the apex, the sides of the depression being much more finely reticulated than the remainder of the egg, but still maintaining its polygonal character. The reticulation, although irregular, suggests a certain amount of vertical arrangement. The egg is uniformly green in colour, the ribbing paler, somewhat transparent, glassy, almost silvery in hue. [Description made on May 26th, from egg laid May 23rd, 1898, belonging to Mr. Filer.]—J. W. TUTT.

The eggs of *Callophrys rubi* described above were laid on the petals of *Ulex europaeus*, and on the leaves of *Helianthemum vulgare*. They are globose, flattened; the micropylar area depressed, covered with reticulation of raised white lines; the egg of a pale sea-green colour; diameter ·027 to ·028 of an inch. In none of my specimens could I find the double white lines described by Hellins; the reticulation was

in single lines throughout.—F. E. Filer, 58, Southwark Bridge Road, S.E. *June 7th*, 1898.

Cupido minima.—Laid on the hairy calyx of *Ornithopus perpusillus*. The egg presents an almost circular outline, ·8mm. in diameter. It is very flattened, the thickness being considerably less than half the diameter. It is of a pale green colour with the surface crossed as in *Polyommatus bellargus*, with two series of oblique lines, dividing the surface up into rhomboidal, or irregularly polygonal, dvisions. The upper surface is not depressed, although somewhat flattened, and, in this respect, differs greatly from the egg of *P. bellargus*. The surface of the upper part of the egg is exactly similar with that of the sides, whilst quite at the apex a comparatively large and bright green micropylar depression is conspicuous. At the base of the micropylar depression the stellate cells arrange themselves around a central white point. At each of the angular points of the reticulation there is a distinctly raised white knob, which is, however, less marked than in *P. bellargus*. As the egg matures it loses its bright green colour and becomes somewhat yellowish. [Described June 24th, 1898, under a ⅞ lens, from eggs received from Mr. R. D. Postans, captured at Eastbourne on June 22nd, 1898.] The eggs examined (4) were all laid on the downy calyces, three forced down edgewise between the long hairs with which the calyx is covered. Buckler says that they are laid between the calyces, these were all laid upon the calyces.—J. W. Tutt.

Polyommatus bellargus (*adonis*).—The egg presents an almost circular outline about ·85mm. in diameter. It is comparatively shallow, the thickness being less than half the diameter; much depressed on the outer surface. It is pale green in colour; the surface covered with two series of oblique lines, running in opposite directions, so that it is covered, as it were, with a very well developed rhomboidal reticulation, fairly regular in some parts, irregular in others. The lines that cut each other to form this reticulation, shiny silvery-white, whilst at each angular point of the reticulation the cutting lines form a prominent white knob. The depressed area at the top forms a shallow basin, occupying the whole of the upper surface. The sides of the basin are covered with a similar reticulation to that which ornaments the outer area, except that the meshes are somewhat finer and smaller. Quite at the bottom of this depression is a minute secondary depression, bright green in colour—the micropyle proper—which is composed of very minute cells. [Described June 20th, 1898, under ⅞ lens, from eggs received from Mr. R. D. Postans, captured at Eastbourne on June 2nd, 1898.] Viewed edgewise the egg appears white but for a pale green tint, which is just visible below the deep reticulation. The green tint is faint, even on the top, except at the micropyle. J. W. Tutt.

Euplexia lucipara. The eggs when first laid are of a pale straw-yellow, changing in two days to pearly-grey with a yellow tinge, a small reddish patch occupying the micropylar area, and a broken reddish ring round the shoulder of the egg. The egg forms rather more than half a sphere, of nearly 1mm. diameter, slightly rounded at the base, and about ·7mm. in height. The eggs are laid somewhat irregularly, some singly, others just in contact, others, again, simply imbricate, but this is due, perhaps, to the moth being so confined in the small box in which the eggs are laid. The base of the egg is coarsely pitted. The sides have 25 vertical ribs running from the base to the micro-

pylar area; these are fine, somewhat sharply edged, and crossed by 22 very similar horizontal ones that divide the surface of the egg into roughly rectangular spaces. The vertical ribs decrease as they near the apex, some disappearing at about a third from the base, others at the shoulder of the egg, two adjacent depressions being continued as one by the sudden suppression of a rib. The micropylar area forms a rather large depression, with reticulated sides and a raised central stella, formed of six adjacent arcs, with the convexity turned outwards. [Described July 15th, 1898. The measurements evidently want checking. Moth captured at Westcombe Park, on July 13th.]—J. W. TUTT.

Taeniocampa gracilis ab. *rufa*.—Pale yellow in colour, the surface covered with what appears to be a very coarse and rough reticulation, the latter being formed by about 50 irregular longitudinal ridges, running from the base towards the apex, and crossed transversely. Above the shoulder the ridges are lost, and the upper surface is reticulated by irregular polygonal areas. The micropyle itself is conspicuous with ten very distinct oval cells, pointing towards centre surrounding it. The colour then changes to a rather dull orange with some small and rather faint (at first) irregular red patches. The egg forms a little more than one-half of a sphere, somewhat flattened ventrally, and less so towards the apex. [Described May 12th, 1899, under a ⅔ lens, from eggs sent by Mr. Christy, laid May 8th, the parents bred from larvæ obtained in the New Forest, in 1898, feeding on bog-myrtle, and fed up in captivity on sallow and dock.]—J. W. TUTT.

Panolis piniperda.—Of a greenish-yellow when received, rapidly changing to a distinct purple. Each egg forms little more than a half of a sphere, with a flattened base, the top occupied by a very conspicuous depression, in the centre of which the micropyle is distinctly raised, the ribbings of a distinctly Noctuid type, the longitudinal ribs passing from the base to the apex, about 50 in number, are round-edged at summit, wavy in outline, the space between divided up by transverse concentric rings into many oblong areas. The longitudinal ribs unite in twos or threes on a point above the shoulder, about 16 reaching the micropylar area, around which they form a sort of raised rim. The micropyle proper consists of a small depression at the apex of a small truncated cone, situated centrally in the depressed micropylar area. The ribs (longitudinal and transverse) very shiny. [Described May 5th, 1898.]—J. W. TUTT.

Spilosoma menthastri.—Size as nearly as possible ·625mm. in diameter, almost circular in outline, forming rather more than two-thirds of a sphere, being flattened at bottom. To the naked eye they appear of a very pale yellow colour, but under a lens they are pearly, the yellow having to a large extent disappeared. The surface is covered with a delicate polygonal reticulation, somewhat irregular, the number of sides of the polygons varying from 4 to 6, the majority are however 5-sided. At the apex of the egg there is a small circular depression, on the sides of which the ordinary reticulation of the rest of the egg-shell is continued, but the cells formed are here considerably narrower and lengthened as they approach to bottom. At the lowest point of the depression six long oval cells meet at the central point, the micropyle proper. Laid in batches on the inside of a matchbox, June 27th, 1898. [Described same date under a ⅔ lens, magnifying 188 diameters.]—J. W. TUTT.

Acidalia remutata.—·45mm. high, ·8mm. wide. Pale yellow when

first laid, becoming almost crimson to the naked eye in the course of a few days. The eggs are scattered about on the tiny splinters which project from the inside of a chip-box, sometimes clustered together in little batches of as many as a dozen, at others laid singly. The most remarkable character of these eggs is that they are laid upright, that is with the micropyle at the apex, and in no instance is there a single egg laid on its long side. This resemblance to a butterfly egg is enhanced by its peculiar shape and ribbing. In shape it is not unlike a Pierid egg, presenting a long oval in outline, but with truncated apex. There are fourteen vertical ribs, somewhat sharp-edged, running from the base to the apex, but having a crenulated appearance where the series of eighteen transverse ribs crosses their upper edges. These ribs end on the margin of the flattened apex, in a series of knobs; within the area thus enclosed the apex is pitted with rather coarse polygonal cells, and is depressed considerably centrally, ending in a distinct stellar depression, at the base of which is the micropyle proper. The colour at this stage is pale yellow, but so plentifully sprinkled with large, irregular, bright red patches, that the egg, to the naked eye, looks entirely crimson. [Described June 23rd, 1898, under a $\frac{1}{8}$-lens, from eggs laid on June 18th, received from Mr. F. G. Whittle. — J. W. Tutt.

Coremia designata (*propugnata*).—The eggs were laid singly or in pairs on the inside of the box in which the female was confined. All were laid on the flat side, and are pale yellow when laid. The egg is roughly oval in outline, but rather broader at the micropylar end than at its nadir. It forms a flattened disc or ellipsoid, with an oval depression on the upper surface, occupying about one-half that surface. The egg is somewhat fuller (thicker) at the micropylar end than at its nadir. It is covered with a strongly marked irregularly polygonal reticulation, the meshes much larger on the central portions of the egg. The micropyle is situated centrally, at the fullest end, and consists of a slightly flattened area, with a central depression, the pitting of the area minute, and the area itself surrounded by concentric rings of the polygonal reticulation, which gradually increases in size as it recedes from the micropyle. [Egg described under a $\frac{1}{8}$-lens, on June 7th, 1898, from eggs laid June 5th, by a ♀ captured at Beddington, Surrey, on June 4th.] —J. W. Tutt.

COLEOPTERA.

Thryogenes scirrhosus and its congeners.—In view of the different opinions with regard to this species held by Mr. Newbery and the authors of the last catalogue of British coleoptera, it has occurred to me that the distinctive characters of our three species of *Thryogenes* might be usefully restated. The characters given for their separation in Cox's *Handbook* I find of no use whatever. The real distinctive characters are given by Canon Fowler, but in the customary form, and this does not indicate the real state of things so clearly as might be wished. For example, in all three species the clothing of the elytra consists entirely of scales, those forming the pale stripe on the sutural interstices being more broadly rounded and different in character from the remainder, but whereas the latter, in *T. scirrhosus* are quite narrow and hair-like, in the other two species they are broadly

rounded at the apex, though to a less degree than those of the suture. *T. festucae* and *T. nereïs* are separable by the difference in the form of the antennæ; these are not easy to appreciate in the first instance, and, in my own experience, the form of the third joint of the funiculus affords a better index character to the differences in question than that of the second. The distinctive character of the three species might be tabulated as follows:—

1 (4) Scales of elytra, including those of the sutural interstices, more or less broad, rounded at the apex.
2 (3) Third joint of funiculus distinctly oblong, about one-half longer than broad.. .. .. *Festucae.*
3 (2) Third joint of funiculus transverse, or about as long as broad.. *Nereïs.*
4 (1) Scales of elytra, exclusive of those on the sutural interstices, narrow, pointed at the apex (hair-like) .. .. .. *Scirrhosus.*

I may add that I have taken *T. scirrhosus* by the Thames and Severn canal at Daneway, Gloucestershire, and the other two species in East Norfolk, *T. nereïs* by the river Yare at Brundall, and *T. festucae* in several localities.—J. EDWARDS, F.E.S., Colesborne, Cheltenham. *March 15th*, 1905.

MELANOPHTHALMA TRANSVERSALIS, GYLL., A SPECIES NEW TO BRITAIN.—Hitherto only the var. *wollastoni*, Wat., has been recorded from Britain. It was first taken by Wollaston, at Mablethorpe, in Lincolnshire, and later Canon Fowler took it in the same locality in numbers. It has also been recorded from Sheerness, Darenth, Chatham, Southend, Kingsgate, Weymouth, Devonshire, and co. Cork, and I have taken it at Wicken Fen. I am now recording the type form *transversalis*, Gyll., itself, which I took on October 15th last, under vegetable refuse at Pevensey, at the same spot where I took *Dibolia cynoglossi* two years ago. Herr Reitter has confirmed the identification. *M. transversalis* appears to be a very variable insect, as there are no fewer than eight named varieties in the last European catalogue. The var. *wollastoni* is a little larger and broader than the type.—HORACE DONISTHORPE, F.E.S. *March 20th*, 1905.

NEBRIA GYLLENHALI, SCH., VAR. RUFESCENS, STRŒM., A BRITISH VARIETY.—The var. *rufescens*, Strœm (*arctica*, Dj.), is the form with the elytra, and sometimes the legs, red. In the *Ent. Record* for 1903, p. 262, I recorded the fact that a red form of *Nebria gyllenhali*, which is quite mature, occurs in the shingle of the Gelt river, in Cumberland, and it is this variety. It also occurs in Scotland, and must, therefore, be added to the British list.—IBID.

OCALEA LATIPENNIS, SHP., IN SURREY.—In June last I took a specimen of this rare "Staph.," at Chiddingfold, at the spot where *Quedius kraatzii* occurs. It has been recorded from Tonbridge, Manchester, Hartlepool, banks of Irthing and Mersey, Scarborough, Wallington, Northumberland, Scotland (rare), and Ireland, Armagh.—IBID.

A WINTER'S DAY AT HAY-STACK REFUSE IN THE ISLE OF SHEPPEY.—As I had to be in London for a few days in the middle of February I arranged with Mr. Donisthorpe to spend Sunday, February 12th, at Sheerness. The weather was bright, sunny, and promising for collecting, and as we had heard there had been heavy floods during the exceptionally high tides earlier in the winter, we expected to find plenty of flood refuse, but, unfortunately, in this we were disappointed, as on making our way on Sunday morning from Queenborough station along the railway line to the Iwade marshes, we found that, although

it was true the sea did break through the banks of the Swale, no refuse worth working had been left behind. We had, therefore, to fall back upon hay-stacks in the marshes, and sift the refuse lying around them, though we also did a little work on the grass tufts and moss along the edges of the fresh-water ditches in the marshes. The day was very bright and sunny, with a bitterly cold wind, after a somewhat sharp night frost. We found, as usual, some of the haystacks more prolific than others, and the first one we struck was by far away the best; whilst a small patch of tidal refuse on the sea side of the banks of the river Swale, a few hundred yards above the railway bridge at Kingsferry, produced a few good insects. The following is a complete list of the captures during the day's work, and during a hurried visit to a hay-stack near Sheerness early on Monday morning, before leaving for town—Monday being a dull, damp day, totally different in climatic conditions from the Sunday. Out of the tidal refuse I secured one specimen of *Mecinus collaris*, Germ.; this refuse also produced *Haploderus coelatus*, Gr., *Homalota vestita*, Gr. (in plenty), *Philorhinum sordidum*, *Ochthebius marinus*, Pk., *Hydrobius oblongus*, Hbst., *Coryphium angusticolle*, Steph., and several other small Staphs. not yet determined. At the roots of the grass by the sides of the ditches, *Apion difforme*, Germ., occurred abundantly, with *Coccidula scutellata*, Hbst., *Bryaxis helferi*, Schm., and *Scydmaenus scutellaris*, Müll. Out of some half-dead willows, by the side of a fresh-water brook, between Queenborough and Kingsferry, we took several specimens of *Helops coeruleus*, L. In the hay-stack refuse, which was certainly the most prolific in beetles, the following were obtained:—*Apion schönherri*, Boh., and *A. varipes*, Germ., both sparingly; *Cartodere ruficollis*, Marsh., which was quite abundant, and varied greatly in size; *Enicmus minutus*, L., *E. transversus*, Ol., *Melanophthalma fuscula*, Hum., and *M. fulvipes* var. *meridionalis*, Reit., *Corticaria crenulata*, Gyll., *Atomaria nigrirentris*, Steph., *A. munda*, Er., *A. basalis*, Er., *A. apicalis*, Er., *Cryptophagus acutangulus*, Gyll., *C. affinis*, Stm., *C. saginatus*, Stm., *C. distinguendus*, Stm., and *C. dentatus*, Hbst., *Calyptomerus dubius*, Marsh., *Sericoderus lateralis*, Gyll., *Ephistemus gyrinoides*, Marsh., *Monotoma rufa*, Redt., *Heterothops dissimilis*, Gr., *Microglossa suturalis*, Sahl., *Oligota atomaria*, Er., *O. pusillima*, Gr., and *Medon propinquus*, Bris.—T. HUDSON BEARE, B.Sc., F.E.S., 10, Regent Terrace, Edinburgh. *March 3rd*, 1905.

PLATYDEMA DYTISCOIDES AND OTHER COLEOPTERA IN THE NEW FOREST. During last year I paid several short visits to the New Forest, and the following are amongst my captures:—*Calosoma inquisitor*, L., in numbers on trunks and lower branches of oaks; *Carabus catenulatus*, Scop., *C. violaceus*, L., *C. arvensis*, Hbst., under stones and logs; *Cychrus rostratus*, L., occurred several times under bark and logs; *Amara lunicollis*, Schiod., and *Amara similata*, Gyll., were both fairly plentiful; *Harpalus rubripes*, Duft., one specimen in a gravel pit; and *H. honestus*, Duft., and *H. puncticollis*, Payk., were very common under ling in the same spot. Many beautiful specimens of *Pterostichus dimidiatus*, Ol., were taken in a gravel pit, in company with a very large and brilliant aberration of *P. lepidus*, F., which were all males, the females being of the usual type. *P. oblongopunctatus*, F., was very plentiful under oak-chips left by the woodmen who had recently been felling trees, at the sap of which hundreds of *Geotrupes sylvaticus*, Pz., were lying in all stages of inebriation. *G. vernalis*, L., also occurred

in the same wood. *Notiophilus aquaticus*, L., *N. substriatus*, Wat., and *rufipes*, Curt., were taken, several specimens of the latter amongst wood-chips; *Leistus spinibarbis*, F., and *L. fulvibarbis*, Dj., occurred frequently under bark; *Bradycellus verbasci*, Duft., in sandy places; and two specimens of *Lebia chlorocephala*, Hoff., were taken running on pathways. Much hard work was given to the search for the rare *Agabus brunneus*, F., without success, but incidentally many common water-beetles were taken, including *Rhantus exoletus*, Forst., *Agabus bipustulatus*, L., and others. *Lucanus cervus*, L., was found to be breeding in an old mound composed of matted roots, and several of the perfect insects, some of which were of very large size, were found near by. The larvæ, pupæ, and imagines of *Dorcus parallelopipedus*, L., were found in some old felled elm near Brockenhurst, in company with the larvæ of *Eryx ater*, F., a number of the latter I succeeded in breeding to the imaginal stage. The larvæ is very elongate, of a yellowish cream-colour, with hard and darker head. The pupal stage lasts about fifteen days, and, in confinement, the imago takes some time to mature. The larvæ of *Sinodendron* were found in rotten willow, and were also successfully reared. *Onthophagus ovatus*, L., and *O. nuchicornis*, L., were taken in several places, as were also *Cetonia aurata*, L., and *Trox sabulosus*, L. On the hawthorn *Anthaxia nitidula*, L., occurred; in rotten wood *Elater lythropterus*, Germ., and *E. elongatulus*, F., were taken, and *Corymbites tessellatus*, F., *C. holosericeus*, F., occurred sparingly, whilst *Athous longicollis*, Ol., was so plentiful as to become a nuisance. A number of Longicornes were taken, and the season seemed to favour them. An early *Aromia moschata*, L., was found near Brockenhurst, and *Asemum striatum*, L., together with its var. *agreste*, was dug out of its burrows in numbers. *Criocephalus polonicus*, Mots., occurred in its old haunts, but even as late as the first week in August imagines were not yet out, and, owing probably to the continuous dry heat, the larvæ were feeding much deeper into the wood than was the case in wetter seasons. *Callidium violaceum*, L., is still making sad havoc of the pretty rustic fences at Brockenhurst, and *C. variabile*, L., was taken at Ramnor. *Clytus arietis*, L., *C. mysticus*, L., *Rhagium inquisitor*, F., and the almost white form of *R. bifasciatum*, F., and *Toxotus meridianus*, L., were plentiful. I came across one specimen of *Anoplodera sexguttata*, F., a few specimens of *Leptura fulva*, De G., and *L. scutellata*, F., occurred in numbers. The remaining Longicornes were *Strangalia armata*, Hbst., *S. nigra*, L., *S. melanura*, L., *Grammoptera tabacicolor*, De G., *G. ruficornis*, F., *Leiopus nebulosus*, L., and *Mesosa nubila*, Ol. In dead animals the following were plentiful, sometimes swarming:—*Necrodes littoralis*, L., *Hister cadaverinus*, Hoff., *Necrophorus vespillo*, L., *Silpha opaca*, L., *S. thoracica*, L., *Dermestes murinus*, L., and on tree-trunks and under bark *Ditoma crenata*, F., and *Mycetophagus piceus*, F., were seen in plenty. *Aspidiphorus orbiculatus*, Gyll., in fungus, and of the remaining clavicorns *Anatis ocellata*, L., and *Soronia punctatissima*, Ill., may be mentioned. The best capture was one specimen of *Platydema dytiscoides*, Ross., which I came across under bark, and near the same spot *Melandrya caraboides*, L., and *Rhinosimus planirostris*, F., occurred. One specimen each of *Ischnomera coerulea*, L., and *I. sanguinicollis*, F., were taken at Queen's Bower, and a specimen of *Pyrochroa coccinea*, L., was netted on the wing, and *Tomoxia biguttata*, Gyll., was dug out of

an old beech tree in some numbers. *Attelabus curculionoides*, L., *Cleonus sulcirostris*, L. (under ling in gravel pits), *Balaninus venosus*, Grav., *B. villosus*, F., *Hylastes ater*, Pk., *Miarus campanulae*, L., *Orchestes quercus*, L., *O. rusci*, Hbst., and many other weevils were taken. My captures of Staphylinids during these visits I hope to make the subject of a further note. The weather in each visit was glorious, and I found collecting each time very pleasant and satisfactory.—H. WILLOUGHBY ELLIS, F.E.S., Knowle, Warwickshire. *February 24th*, 1905.

COLEOPTERA FROM FAVERSHAM DISTRICT, ETC.—The following captures of coleoptera from this neighbourhood and elsewhere are perhaps worth recording: *Aphodius consputus*, Cr., on October 11th, 1904, not uncommon, flying in a field near Doddington. *Bruchus canus*, Germ., swept in August not far from Eastling Mill. *Tetratoma desmaresti*, Lat., on one tree in Shanted, end of September. *Choragus sheppardi*, Kirb., on old hedge at Charing early in September. *Apion livescerum*, Gyll., in a saintfoin field near Huntingfield, September, October, and November. *Apion waltoni*, Steph., swept on a mossy bank in a valley near Huntingfield; *A. vicinum*, Kirb., occurred with it. *A. filirostre*, Kirb., one swept near Charing and one near Newnham, in each case with *A. flavimanum*, Gyll., and *A. pubescens*, Kirb., which were very abundant on any suitable grassy bank on which thyme or marjoram was growing. *A. filirostre* is evidently very difficult to get except singly; I had previously a specimen from Huntingfield and one from Doddington, so it must occur all over the district; when once identified it is not difficult to recognise in the net, though, of course, to the naked eye, it closely resembles *A. loti*, Kirb., which is very abundant in the district. This autumn was a very remarkable one for the genus *Apion*: a visit to Deal produced *A. laevicolle*, Kirb., *A. curtisi*, Curt., *A. sedi*, Germ., *A. marchicum*, Hbst., and *A. urticarium*, Hbst., besides the usual common species; a visit to Rye produced *A. dissimile*, Germ., one to Sheppey, *A. malvae*, F., and *A. bohemani*, Th., the latter in some numbers on its proper foodplant, and one to Oxford, gave *A. ebeninum*. *A. flavipes*, F., also occurred at the end of September, at Doddington, in a wood on its proper foodplant, it is, however, very local in the district, as I had swept a great quantity of *Mercurialis perennis* before discovering it. Further insects from the Faversham district are *Magdalis barbicornis*, Lat., one ♂, June 26th; *Atomaria fumata*, Er., June; *Hypophloeus bicolor*, Ol. (one), under elm bark, August, all near Huntingfield. *Pentarthrum huttoni*, Woll. (1), and *Mycetaea hirta*, Marsh., in my cellars, considering the isolated situation, this is somewhat surprising. *Homalota liturata*, Steph., Lees Court, in fungus on ash-tree in 1901, very recently identified, I have not seen it since, while from the Blean Woods this summer, *Sitones cambricus*, Steph. (two), *Rhytidosomus globulus*, Hbst. (one), *Mordella aculeata*, L. (three), were useful to my collection. Old hedge collecting was, in the autumn, as productive as ever of the insects that live in these quarters, and in addition to those previously recorded by me, *Scydmaenus exilis*, Er., was found, though very rarely, in a hedge near Charing. A. J. CHITTY, M.A., Huntingfield, Faversham, Kent. *February 16th*, 1905.

NOTES ON SOME INTERESTING CAPTURES IN A LONDON GRANARY.—My friend Mr. H. Dollman (whom I had introduced to the old granary in Holborn where I have taken so many species of coleoptera), having

informed me that *Ptinus tectus** was now to be got there, I decided to go with him, as I had never taken that beetle before. We accordingly paid a visit together on December 17th last, and found that *P. tectus* was in numbers all over the granary from the attic to the cellars. It must have developed very rapidly of late years, as, heretofore, only two specimens have been obtained from this locality, which were taken by my friend Mr. Chitty, in 1892 (*Ent. Mo. Mag.*, 1904, p. 109). *Mycetophagus 4-guttatus* also occurred in the utmost profusion, and many specimens of *Cryptophagi* including *C. distinguendus**, *C. saginatus*, *C. bicolor**, and *C. cellaris*. On January 10th we went again, and this time the best capture was *Oligota granaria**, of which a nice little series was taken. I was especially looking out for this insect, as the week before, Mr. E. A. Waterhouse had observed that he wondered I had never turned it up at the granary. Canon Fowler writes of this interesting little Staph. (*Col. Brit. Isles*, ii., p. 175): "Very rare; introduced by Mr. G. R. Waterhouse on the strength of a specimen taken by himself (but without locality), has also occurred at Scarborough. According to Mulsant and Rey it is rare in France and lives in cellars on the black mould (*Mucedo cellaris*) that grows on walls and casks, etc.; it is found in company with *Cryptophagus*, *Mycetaea hirta*, and *Orthoperus atomarius*. These species are found together in Britain and probably the *Oligota* will be found with them if searched for." Linnel records (*Nat. Hist. Reigate*, iii, 1898, p. 29) one specimen taken by his brother near Red Hill Station, in 1859, and B. G. Rye took it in the cellar of a public-house in Shoe Lane, in 1893. We found our specimens on boards which were leaning against the wall in a cellar, and *Atomaria nigripennis** (also a cellar species), *Mycetaea hirta* and *Cryptophagi* occurred in numbers with them. Several specimens of *Lathridius bergrothi** were taken at the same time. This little beetle appears to be spreading over England in the same way that *Coninomus nodifer* has done. It has now been recorded from Nottingham (Thornley), Chesham (Elliman), Oxford (Holland), Wells, Norfolk (Joy), Southampton (Gorham), Winlaton (Bagnall), and London. On January 13th, my friend Mr. Chitty went with me to take the *Oligota* and the *Atomaria*, both of which were secured. The beetles had left the planks and were on the walls, and under the plaster on the walls, but were not so abundant as before. I obtained the *Lathridius* again. Mr. Saunders tells me that a Psocid which occurs in some numbers on the walls, etc., is *Clothilla picea*, and some Chelifers I sent to Mr. O. P. Cambridge are new to Britain; these make the second new species I have sent him from this granary.—HORACE DONISTHORPE. *January 31st*, 1905.

DERMESTES PERUVIANUS, LAPORTE, AT LIVERPOOL.—I have for some time known of the existence of this cosmopolitan species in Liverpool, having received specimens both of the larva and the imago by the kindness of my friend, Mr. Richardson. As the species now seems firmly established in the St. John's Market, it seems worth a record. It feeds upon beef, mutton, and pork, and specimens are sometimes to be seen flying about the market in the middle of summer. The only European record for this species seems to be France.—J. R. LE B. TOMLIN, M.A., Chester. *March 25th*, 1905.

*NOTE.—The species marked with an asterisk are new to my list of the beetles of this granary (see *Ent. Record*, 1897, p. 77).

APHODIUS TESSELATUS, PAYK., AT BIRKDALE.—I took a small series of this species on the Birkdale sandhills, on March 21st, by dint of examining large numbers of *A. inquinatus*. It does not appear to have been taken previously in the Southport district.—IBID.

VARIATION.

POSSIBLE GYNANDROMORPHOUS SPECIMEN OF THYMELICUS THAUMAS.—It may, perhaps, interest your readers to know that, on July 22nd, 1900, I took a male example of *Hesperia* (*Thymelicus*) *thaumas*, Hufn., at Ashton Wold, Oundle, which entirely lacks the cell streak. Has this peculiar form been previously recorded?—N. C. ROTHSCHILD, B.A. *March 25th*, 1905.

MELANIC PHIGALIA PEDARIA IN MIDDLESEX.—I took a very fine melanic ♂ *Phigalia pedaria* here on February 26th. This is quite a new form for the district.—H. M. EDELSTEN, F.E.S., Forty Hill, Enfield. *March 11th*, 1905.

NOTES ON COLLECTING, Etc.

EARLY LEPIDOPTERA.—On the evening of March 19th, I took a specimen of *Amblyptilia acanthodactyla*, and on the night of the 22nd, *Xylina ornithopus*, one only, at sallow in my own garden. Harwood has taken both at Colchester, and Howard-Vaughan records *A. acanthodactyla* from Leigh, but they have not apparently occurred elsewhere in the county. It appears extraordinary, their occurring at Hazeleigh, and my never having come across them all these years.—G. H. RABNOR, M.A., Hazeleigh Rectory, Maldon.—*March 23rd*, 1905.

SOARING HABIT IN GONEPTERYX RHAMNI. WHAT ARE THE PAIRING HABITS OF THE SPECIES?—Under "Lepidoptera observed at Basle" (*Ent. Record*, March 15th), I notice our Editor alludes to the peculiar aerial flight of *Colias hyale* when (presumably) courting. Over and over again I have witnessed the same habit in the case of *Gonepteryx rhamni*, and with the same result, that is to say, with no result whatever. The insects, after a prolonged excursion upwards, return to Mother Earth, only to fly off in opposite directions, leaving the spectator in wonderment as to all this, apparently, useless fuss. Though I have no better solution to offer than the one suggested, I rather doubt its being correct. A butterfly's life is not so long, nor the hours of sunshine too numerous, that it can afford to waste much time in frivolous flirtations. The fluttering action of the ♀ (distinct from the flight of the ♂), under the circumstances, certainly gives one the impression that she is doing her utmost to attract the ♂. However, if the performance is a mere demonstration, it is singular that it should be of such constant occurrence, whereas the actual pairing is so seldom (at least in my case) observed. *G. rhamni* appears every spring in my gardens in considerable numbers, the ♂s come out first, and, throughout the season, are greatly in excess of the ♀s. (On March 12th I noted three ♂s together in one spot.) Some years scarcely a ♀ is to be seen, yet the supply does not appear to vary much from one season to another. May it be that the ♀s keep more in hiding and show less on the wing? Although I have ample opportunities of observing *G. rhamni* in all its stages, I am still in ignorance as to this matter of pairing—when and where does it take place? There seem to be some mysteries

still requiring elucidation, even of the common species, and I think it would be interesting and profitable if correspondents would give their experiences on some of these, perhaps, less important considerations.—C. BINGHAM NEWLAND, Wishanger, Farnham. *March 25th*, 1905.

CURRENT NOTES.

The last monthly meeting of the Entomological Club was held at 58, Kensington Mansions, South Kensington, on Tuesday, March 21st, at 6.30 p.m., when Mr. Horace St. J. K. Donisthorpe was the host. Tea having been served by Mrs. Donisthorpe, the early arrivals accompanied Mr. Donisthorpe to his museum, where many interesting things were inspected. A return was made about 8 p.m., and an excellent supper was served at 8.30 p.m. The menu was exceptionally attractive. Among the members and visitors present were—Messrs. R. Adkin, F. Bouskell, H. Rowland-Brown, J. Collin, A. J. Chitty, A. H. Jones, W. J. Kaye, R. S. Mitford, C.B., F. Merrifield, W. E. Sharp, R. South, J. W. Tutt, G. Verrall, E. A. Waterhouse, Colonel Swinhoe and Colonel Yerbury.

Orthopterists should be very grateful to Mr. W. F. Kirby for the first volume of his "Catalogue of the Orthoptera," which has recently been published by the trustees of the British Museum. Although the saltatorial Orthoptera are not included, this forms a thick volume of over five hundred pages, including a complete index, which is not the least useful part of the work. Mr. Kirby returns to the old names of the groups; the title-page states that the volume includes the "Orthoptera Euplexoptera, Cursoria et Gressoria," and the old family names *Forficulidae*, etc., are given in brackets beneath. The conscientiousness of the author is noticeable in several instances where names that are usually regarded as accepted synonyms are given as distinct species, *e.g.*, *Spongiphora parallela*, Westwood, *S. herminieri*, Serv., *S. dysoni*, Kirb., and *S. croceipennis*, Serv., which are not even placed together. But so complete a catalogue has long been wanting, giving full references and an outline of the geographical distribution. We hope the second volume will appear with no long interval, and await it with a lively sense of favours to come.

The Entomological Society of Leicester, after an unexpected period of æstivation, following its brilliant spring-like entry into existence a few years ago, has reawakened once more into active existence. The members thereof, under the chairmanship of Mr. G. B. Dixon, and the vice-chairmanship of Mr. F. Bouskell, met at a most successful social function, to wit, dinner, at the Royal Hotel, Leicester, on February 24th last. The guests comprised Messrs. H. St. J. K. Donisthorpe, H. W. Ellis, and W. J. Kaye. Among others present were the Revs. A. R. Birkenhead and G. W. Wittingham; Drs. W. H. Barrow and Dodd; Messrs. Holyoak, A. Cholerton, W. Pearson, Pierpoint, W. Reddish, Taylor, Hawthorne, Raven, T. Walker, W. A. Vice, M.B. Letters of regret at not being able to be present were read from Professor T. H. Beare, Mr. A. J. Chitty, and Mr. J. W. Tutt. There was, as usual, an excellent "Entomological" menu, and nearly every one present had brought interesting entomological specimens to exhibit at the informal meeting held before the dinner.

Mr. Austen adds (*Ent. Mo. Mag.*) two diptera—*Frigone pecti-*

nata, Girsch., taken at Tarrington, August 1st, 1902, and *E. truncata*, Zett., taken at Aviemore and Glenmore, Inverness, between May 19th and July 5th, 1904, and others from Golspie, Sutherland, and Porthcawl, Glamorgan—to the British list. He also confirms, as British, *E. intermedia*, Ztt., from specimens taken at Porthcawl, between May 12th and July 1st, 1903. All the examples were captured by Colonel Yerbury.

An excellent further contribution to the fauna of the Balkans has been published by Dr. H. Rebel (published by Alfred Hölder, 1, Rotenturmstrasse, 13, Vienna), with two first-class plates—the one on *Colias myrmidone* and its aberrations being particularly beautiful. All our British collectors of European butterflies must of necessity get Dr. Rebel's papers.

Mr. Morice adds three sawflies to the British list, *Pamphilius gyllenhali*, Dahlb., from Colchester, *Amauronematus moricei*, Konow, from Doddington, in Kent, and *Lygaeonematus paedibus*, Konow, from Huntingfield, also in Kent.

Mr. Champion adds *Malachius spinosus*, Er., to the list of British coleoptera, from specimens taken at Sheerness, June 6th, 1869, in company with *M. viridis*.

The Entomologist's Directory, recently published by W. Junk (22, Rathenower-Strasse, N.W. Berlin), is by far the best book of its kind ever offered to the entomological public. In the first part, the entomologists of every country, in every continent, are separately dealt with, and the number of names and addresses thus brought together is enormous, and, considering its extent, the errors are remarkably few. We notice the names of a few deceased entomologists, and a few occur twice, at old and new addresses, possibly taken from out-of-date lists, but it is astonishing, however, how few there are. The second part consists of a classified list of entomological books on sale in every branch of entomology. It is an excellent 5s. worth, and one that no doubt will have an enormous circulation, as it fills a great want.

Mr. W. Neuberger, of Berlin, sends us a detailed exchange list (28 pp.) of the Palæarctic Macrolepidoptera, with varieties, &c., arranged after Staudinger and Rebel's *Catalogue*. It can also be used as a label list, the names being printed on one side of the paper only. It can be obtained for 2s. from the author, 45 Luisen-Ufer, Berlin S. 42.

On the evening of March 11th, Mr. A. Sich invited a few entomological friends, members of the South London Entomological Society, to dine with him at the National Liberal Club. Politics and evening dress were barred. A most pleasant evening was spent, and, after dinner, many entomological subjects were informally discussed. Among the friends present were Messrs. R. Adkin, F. N. Clark, S. Edwards, A. Harrison, H. Main, R. South, E. Step, H. J. Turner, and J. W. Tutt.

It is with the greatest regret that we announce the death of Dr. Alpheus T. Packard, on February 14th last, at the age of 67 years. He was one of the giants of early American lepidopterology, and when the history of progress of that science in America, in its early and more difficult days, comes to be written, few names will bear a more honoured position than that of the enthusiastic and learned entomologist for whose loss we now grieve.

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Exchange.—I am desirous of obtaining butterflies from the Malayan Archipelago, and the Pacific Islands. For such I offer perfect diurnals from North and South America, North American Coleoptera.—*Levi W. Mengel, Boys' High School, Reading, Pa., U.S.A.*

Wanted.—Erycinidæ of the world. Offer for same Diurni from United States. *Levi W. Mengel, Boys' High School, Reading, Pa., U.S.A.*

Wanted.—Parasites from British Coleoptera. Beetles infested with *Gordius*. Any material will be gratefully acknowledged.—*H. St. J. K. Donisthorpe, 58, Kensington Mansions, S.W.*

Parasitical Diptera wanted.—Will lepidopterists who may breed any dipterous parasites from larvæ or pupæ kindly forward such as they do not require to me? If so I shall be greatly obliged.—*C. J. Wainwright, 2, Handsworth Wood Road, Handsworth, Staffs.*

. . . .

MEETINGS OF SOCIETIES.

Entomological Society of London.—11, Chandos Street, Cavendish Square, W., 8 p.m. Meetings: April 5th; May 3rd; June 7th.

The City of London Entomological and Natural History Society. London Institution, Finsbury Circus, E.C. The first and third Tuesdays in the month, at 7.30 p.m., except in July and August.

Toynbee Hall Natural History Society. Held at Toynbee Hall, Commercial Street, E., Mondays, at 8 p.m., April 3rd. Field Meetings: April 16th, Uxbridge, Shepherd's Bush) Cent. Lond. R. Station, 10.30 a.m.).

The South London Entomological and Natural History Society, Hibernia Chambers, London Bridge. The second and fourth Thursdays in each month, at 8 p.m. April 27th, "The Spot we stand on," by A. Sich, F.E.S. May 11th, "Some Social Beetles," by Gilbert J. Arrow, F.E.S.; May 25th, "General Exhibition of Spring Lepidoptera"; May 27th, "Field Meeting at Seal, Kent." Conductor R. Adkin, F.E.S.

North London Natural History Society, Hackney Technical Institute, adjoining Hackney Downs Stations, G.E.R., at 7.45 p.m. The 2nd and 4th Tuesdays in the month. Papers: May 9th, "Tramp round Exmoor," by S. Austin; May 23rd, "Our Rarer Butterflies—Are they in danger of Extinction," by J. A. Simes. Field Meetings: April 21st-24th, Selborne, Hants; April 29th, Toot Hill, Ongar (cycles meet at The Eagle, Snaresbrook, 3.30 p.m.). May 13th, Kew Gardens (Broad Street, 2.22 p.m.). May 27th, Pinner (cycles, Muswell Hill Station, 3.45 p.m.).

Lancashire and Cheshire Entomological Society. Hon. Sec., E. J. B. Sopp, 104, Liverpool Road, Birkdale. From whom all necessary information can be obtained.

Birmingham Entomological Society, Norwich Union Chambers, Congreve Street. —Monday evenings, at 8 p.m. May 15th, June 26th.

Monograph of the British Pterophorina.

By J. W. TUTT, F.E.S.

(Demy 8vo., 161 pp., [illegible] Cloth.)

A few copies having unexpectedly come to hand, [illegible] at 5/- per copy.

This book contains an introductory chapter on "Collecting," "Rearing," and "Setting" the Pterophorina, a table giving the [illegible] species. The [illegible] appearance of larva, of pupa, and of imago, food plants, mode of pupation, and a complete account (so far as is known) of every British species under the headings of "Synonymy," "Imago," "Variation," "Ovum," "Larva," "Food-plant," "Pupa," "Habitat," and "Distribution." It is much the most complete and most worthy account of this interesting group of Lepidoptera that has ever been published.

The Migration and Dispersal of Insects.

(Demy 8vo., 132 pp., [illegible] S[illegible]).

This book, the only one published at [illegible] price, is of first importance to all students of the [illegible] and contains the following chapters:—

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Only a small number of copies have been printed. [illegible] entomologists will, besides supporting the work themselves, recommend it to libraries in which they are interested or with which they are connected.

Mr. J. H[illegible] Tr[illegible] 19, Westbourne H[illegible], S.E.

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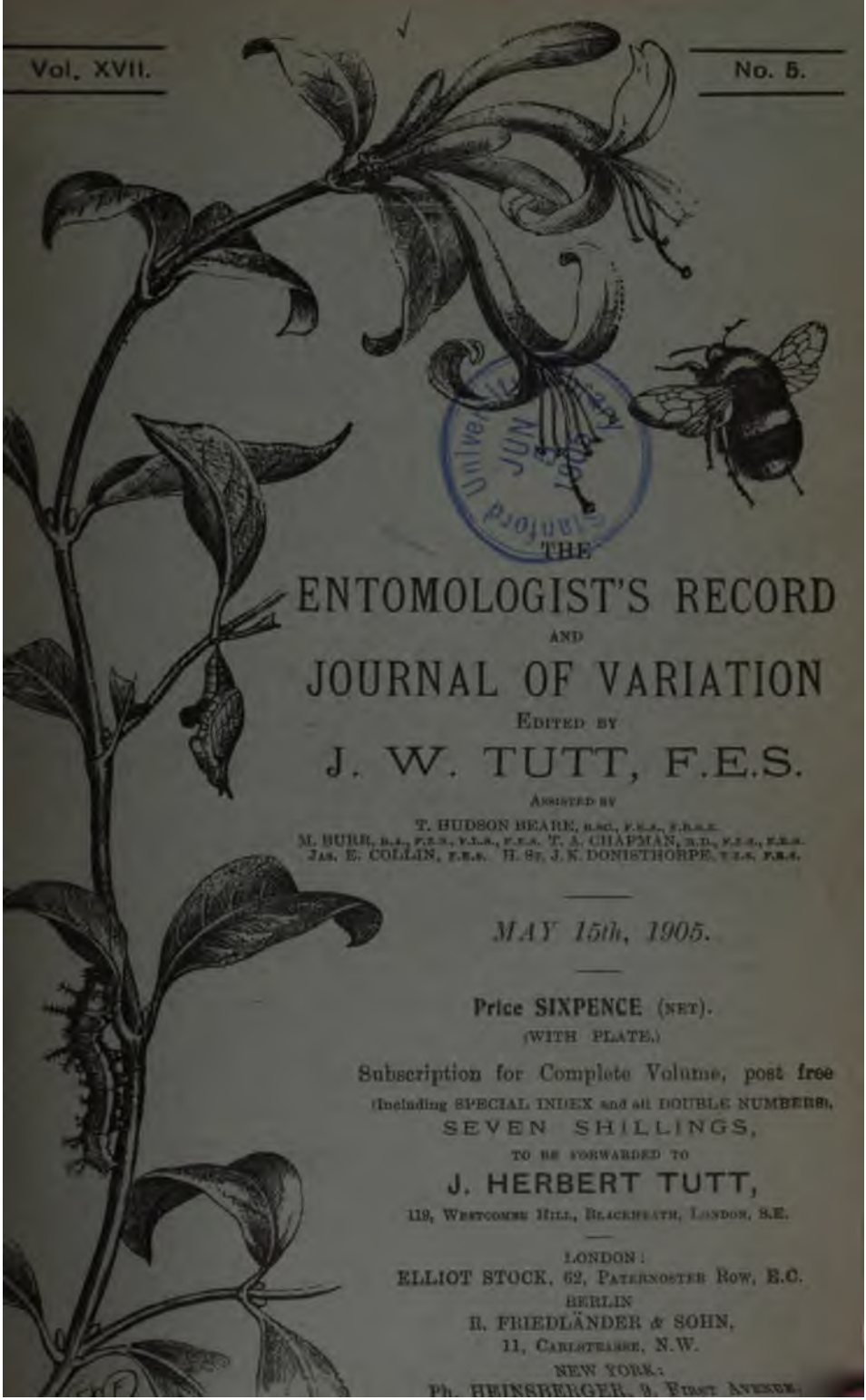

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Photographing lepidopterous ova.

A method of photographing lepidopterous ova (*with plate*).

By A. E. TONGE.

It is comparatively quite a short time ago since I found a batch of ova of a lepidopterous insect on a blackthorn twig, and was much surprised to discover what a difficult matter the accurate identification of the species proved to be. I know now that it was quite a common one, but the incident served to show how very little is known about the ova of our moths and butterflies, even by those to whom their subsequent life-history is quite familiar, and, as a result, I hit upon the idea of bringing photography, of which I had some slight previous experience, to my aid, in order to throw some light on this apparently obscure department of entomological science. The outcome of this has been many hours of most pleasurable and interesting work for myself, and I trust that the photographs which have been published in Part III of *Practical Hints for the Field Lepidopterist*, one plate of which was reproduced in the *Entom. Record* for February last, and the brief account of my method of working, which Mr. Tutt was good enough to ask me to contribute for this most useful publication, have not been without interest to others.

It may, therefore, not be out of place here to express my thanks to those many friends who have so kindly lent me ova of various species from time to time in order that I might photograph them, and to hope that they and others will continue similar help in future, as I have only been able to do a comparatively small portion of the British lepidoptera as yet, owing to the limited amount of leisure time at my disposal. I particularly want help with ova of the British "Plume" moths of *all species*, for reproduction in the next volume of *British Lepidoptera*, upon which Mr. J. W. Tutt, Dr. T. A. Chapman, and Mr. A. W. Bacot are at present engaged.

My first attempts at photographing ova were made with an ordinary ½-plate stand camera, focussing from the *back*, attached to a student's microscope, and with this I was able to obtain results which surprised me, but was handicapped by the short extension obtainable with the camera (about 15in.), as this necessitated using the eyepiece of the microscope to bring the image to a focus at a point nearer the objective than would otherwise be necessary. This caused some loss in definition, and I also had considerable difficulty in getting an objective of long enough focus to cover the whole of a small batch of ova and at the same time admit of the object being focussed with the eyepiece I possessed. Having obtained a 3in. objective which filled these necessary requirements, the next step was to construct a base board on which to fix the camera and microscope in proper alignment. For this purpose I used a smooth deal board about 3ft. long, 6in. wide, and 1in. thick, and ruled a straight line down the centre from end to end as a guide to obtaining a proper alignment of the completed apparatus. On placing the camera and microscope upon it, with the body tube of the latter lowered to a horizontal position, I found that the line of projection was considerably below the lens aperture in the camera front, so the next step was to construct a block for the microscope to stand upon, which would raise it sufficiently to bring the eyepiece exactly in the centre of the lens aperture, and permit of an imaginary line being drawn horizontally from the centre of the

objective to the centre of the focussing screen of the camera, and passing centrally through the intervening portions of the microscope body and the camera. This block I screwed down firmly in the required position, and fixed small wooden stops at the sides and ends to prevent the microscope from slipping when placed on it.

I then drilled a hole for the camera screw in the centre of the base board, in such a position that, when the camera was screwed down to it, the lens front just touched the eyepiece of the microscope, when the latter was racked out to its fullest extent. It was now necessary to devise some means of connecting the microscope with the camera in such a way as to exclude all light except that passing through the former, and yet to admit of focussing being done as usual. To do this I obtained from an instrument maker a short brass tube about 1in. in length, with a screw thread cut on one end to fit the lens flange of the camera. This I screwed in, in place of a lens, and then made a sleeve of black velvet to slip over it, long enough to be drawn over the microscope body tube, and held in place at either end with an elastic band. This answered admirably, and I found that after focussing an object on the stage of the microscope and then connecting the microscope with the camera, I was able to get a sharp image on the ground glass of the latter with the extension at my disposal, and to reduce or enlarge this by altering the amount of camera extension, and then to refocus with the microscope by stretching out my arm along the side of the camera while I kept my eyes fixed on the focussing screen.

This somewhat primitive apparatus answered well so far as it went, but I soon determined to work without the microscopic eyepiece, and set to work, therefore, to build a very long extension camera. I made it ½-plate size, so that the accessories I already possessed could be used, and gave it a bellows 42in. long in three sections to obviate sagging. I found this was a great improvement, but had, of course, to get a much larger base board, and used for this an oak plank 5ft. × 8in. × 1in. The focussing of the microscope could not now be done by hand, as the distance from the ground glass was too great for my arm, so I carried a long brass rod through wooden blocks under the camera, and fitted a small grooved pulley wheel on it just under the fine adjustment screw of the microscope, and put a milled screw on the other end under the focussing screen of the camera. A fine elastic band passed round the pulley wheel, and the fine adjustment screw then enabled me to focus comfortably, with my head under the black cloth, by turning the milled screw already mentioned. As the microscopic objective had to be brought very considerably closer to the object in order to throw a sharp image on the focussing screen than when focussed with the eyepiece in the microscope alone, I noted from experiment the amount of this variation by measurement, and screwed down the coarse adjustment of the microscope the necessary amount before connecting it with the camera, and, in this way, left only the final focussing to be done with the apparatus described above.

This answered much better and gave me many very excellent results, but I was still not satisfied, as I found that, unless the ova I wanted to take were small or had a comparatively flat upper surface, only a portion of the resulting picture came out sharp, and all the rest

was out of focus, owing to the lack of penetration in the microscopic objective. To improve this I adapted a rapid rectilinear photographic lens of 5in. focus to fit the body tube of the microscope in the place of the usual objective, and as this rendered the stage useless for holding the object to be photographed, as the distance obtainable between it and the lens was much too short for so long focus a lens, I took advantage of the circular opening in the stage to work through, and fixed up a movable slide carrier in proper alignment working behind the supporting block on which the microscope stood. This was a great advance, but I was not, of course, able to get so large a magnification as with the microscopic objective, as, even with the aid of a special extension which I fixed up between the camera lens front and the microscope body tube, which enabled me to obtain a maximum extension of 5ft. between the focussing screen and the lens, I could only get a magnification of about ten diameters, while the exposure required was nearly doubled. On the other hand, I had the advantage of an iris diaphragm in the lens, so that I could focus with this open to the fullest extent and admitting the maximum amount of light, and then stop down to f. 16 or f. 22 for the exposure, and in this way get the whole of a large ovum like *Mimas tiliae* or *Eutricha quercifolia* in focus, including even the background. [See plate I., fig. 2, reproduced in the February number of the *Entom. Record* from Part III of *Practical Hints.*]

A very powerful illuminant is an absolute necessity for this kind of work. I started with a paraffin lamp, but soon found this useless, not only on account of the amount of heat it gave out, but also owing to the lack of contrast obtainable in the illumination, and particularly to the very great difficulty in focussing accurately when the ground glass image was so faintly lighted. Fortunately I was able to avail myself of an electric light installation, and found a ·25 Amp.-Nernz lamp admirable in every way, as it gave a 25 to 30 candle-power light, and this, with a single condenser on one side of the object and a mirror reflector on the other to reduce the blackness of the shadows it made, appeared as nearly ideal as I could imagine. I have not tried incandescent gas myself, but I understand from friends who use it that it gives equally good results. Still I should imagine that the heat trouble would obtrude itself, especially if the light were placed near to the object, whereas with the Nernz lamp the light can be approached to within 3in. of the ovum being operated on without any untoward results. The great points to bear in mind are to get a brilliant illumination of the object from one side, and a somewhat less powerful lighting on the other, so as to show up the structure and rotundity of the ovum by contrast. The final critical focussing is best accomplished with the aid of a focussing magnifier held against the ground glass focussing screen, and fixing the attention on some brightly illuminated spot on the surface of one of the ova to be photographed.

After focussing and placing the sensitive plate in position, it is only necessary to cover the lens with a piece of black card while drawing out the flap of the dark slide, as any small amount of indirect side light entering the lens is quite negligéable, and the card is more conveniently manipulated than a lens cap. The exposure necessary will naturally vary with the brilliancy of the illumination and the

colour of the ova, but there is a large amount of latitude permissible with most of the dry plates on the market. I use the most rapid isochromatic plates I can obtain, always backed to minimise halation, and find that with the 8in. microscopic lens and a magnification of twenty diameters an exposure of two and a half to four minutes, according to the colour of the ova, is about right. With the 5in. Rapid Rectilinear, stop f. 16, magnification ten diameters, and similar illumination, I should give from four to seven minutes, but these exposures might be doubled without detriment to the resulting negative by a slight addition of bromide of potassium to the developing solution.

For holding ova in position while being photographed I use ordinary glass slips 3in. × 1in., such as are used for mounting microscopic slides. Ova *in situ* on bark, portions of leaves, paper, etc., are easily fixed with a small dab of adhesive material, and, where needed, a background of suitably toned paper can be gummed on to the glass slip first, and then the support for the ova fixed upon it. When the ova are loose, and particularly if it be desired to retain them uninjured for subsequent hatching, I find a most suitable method of mounting to be as follows:—Cut out a small square of gummed paper, say ¾in. each way, and punch out a circular hole in the centre ¼in. in diameter. An ordinary cork boring drill does this admirably. Then cut another smaller square of paper, tinted to suit the ova in question, and gummed on one side. This should be a little larger than the hole alluded to above, say $\frac{5}{16}$in. square. Place the small square, gummed side *upwards*, in the centre of the glass slip, moisten the gum of the larger square, and press it down upon the smaller, so that the hole is entirely filled up, and all is held firmly to the glass slip. Now moisten a fine hair pencil between the lips and pick up a single ovum on the point of it. Breathe upon the prepared gum surface within the ¼in. hole, and place the ovum lightly upon it. Continue the process with as many ova as you wish to photograph at once, and they will all be found to adhere quite as firmly as is necessary for the purpose in hand, while they can easily be brushed off afterwards, and will be none the worse for the treatment they have undergone. At least one ovum of each species should be mounted upon its side, as it will then be available afterwards to afford measurements otherwise unobtainable from the resulting photograph.

It is a very good plan to line the box, in which living ♀s are put for the purpose of obtaining ova, with paper, as then the ova will be laid in most cases on the paper, and are easily accessible, whereas, if they are laid directly on the sides of the box, these must either be cut up or a thin shave taken from them to obtain the ova uninjured.

The very worst material I know for photographic purposes on which ova can be laid is cotton wool. Each individual ovum must be separated from every strand of the wool before it can be mounted with any hope of getting it to lie flat, or of placing the entire batch as nearly as possible in one plane (a most *important* point to remember, or your photograph cannot be in focus all over), while every strand of the cotton which *does* get mounted with the ova, and there are sure to be some, comes out like a piece of rope, and quite spoils the picture. It is only necessary to try to manipulate ova so laid *once*, and you will thereafter be very careful to ask all your friends, when sending you

any, to avoid getting them laid upon cotton wool as they would the plague.

It is unnecessary for me to go into any detail as to methods of developing the negative after it has been taken, as these will vary with the make of plate and the particular developer used, and are easily obtained from the manufacturers; but it is helpful to keep a full note with each exposure of at least the name of species, magnification, lighting, make of plate, exposure given, developer used, and colour and appearance of the ovum. I write these particulars upon the outside of a paper envelope, into which I afterwards slip the finished negative, before storing it away, and I *always* pencil the name of the species upon one corner of the plate before development, so that if it gets separated from its proper envelope at any future time it can be identified with certainty. The envelopes alluded to above should each bear a consecutive number, and if an alphabetical index to these is compiled as they are made, any particular species required in future can be found without loss of time.

The exact amount of magnification is important, and once a convenient size has been fixed on, that, or multiples of it, should be strictly adhered to, as otherwise any comparison will be difficult. An easy method of ascertaining the magnification is to photograph a finely ruled scale in place of the ova, and then compare your negative with the original scale.

Transparency in wings of Lepidoptera (*with plate*).

By WILLIAM J. KAYE, F.E.S.

(*Concluded from* p. 86.)

As it is quite impossible to do justice to any but a very small portion of the subject, I have confined myself almost wholly to diagnosing, in detail, two distinct groups of transparent butterflies and moths from British Guiana, all the individuals of each having occurred on a single forest track. The first group consists of two Syntomid moths, *Agyrta micilia* and *Euagra coelestina*, one Geometrid moth, *Pseudarbessa decorata*, one Hypsid moth, *Iostola divisa*, and an Erycinid butterfly, *Esthemopsis sericina*. In examining such a mimetic group as this the results are doubly interesting, (1) from the variety of methods adopted to attain one end, (2) the almost conclusive proof that these different species are mimics, from the very fact that the methods of obtaining transparency are so different, whereas an universal method would indicate that a common cause was at work, and would be merely accidental or fortuitous if species of different genera looked alike. Most unquestionably, the Syntomid, *Agyrta micilia*, is now the most abundant, and one assumes that it has been the model; but why this species should have developed transparency is difficult to say. If one judged wholly by the scales modified into hairs, one might argue that *Euagra coelestina*, in being more complete in this respect, had, so to speak, set the pattern. In either case, however, both species are brilliant on the wing, and are not specially rapid in flight. When one considers the extreme complexity of a Müllerian association, it becomes exceedingly difficult to decide which species originated, or originally possessed, the type pattern. One recognises that a species once brought into the group, may perhaps develop certain tendencies more

quickly than its model, and itself become the model for the time being. *Agyrta micilia* has, however, an additional transparent apical patch, and, as two other members of the group also have it, we may suppose that, unless the proportion of the different species is materially altered, the *Euagra* and the Geometrid will, in time, also develop apical transparent patches. The details of all five species are as follows:—

AGYRTA MICILIA.—The transparency is produced by the scales first being slightly reduced in size and numbers, in the scales becoming transparent, and finally assuming a hair-like structure and standing up from the membrane. In the hindwing, the transparency is almost complete in the centre of the wing, probably immediately after first flight, as, in a seemingly perfect specimen, to the naked eye, the membrame is almost quite bare of all scales, only a very few being discernible, and these stand up at an angle of about 60 with the wing-surface, and are almost bristle-like. On the inner edge of the outer marginal black band the dark scales are less closely packed than at the middle of the band, and point to the scales having become reduced in number previous to the transparency and angular situation. A few stray black scales are to be seen in position in their sockets, well out into the main transparent area. On the nervures, a few transparent scales are to be detected amongst the black scales. The most transparent portion in the hindwing is between nervures 1*b* and 2, where even the sockets of the scales have vanished. In the forewing, transparency is not nearly so complete, most of the scales are present, but reduced in size, and transparent. In the apical patch, a large number of much-reduced dark scales are mingled with the transparent ones, and clearly indicate that this is the most recent of the transparent patches. The lowest portion of this apical patch shows fewest dark scales, and may be considered to have started earliest.

EUAGRA CŒLESTINA.—The process of becoming transparent is practically the same in this species of Syntomid as in the last. In the hindwing the transparent area is seen to be thinly covered with quite small bristles or hairs, many of which are indicated only by the empty scale-sockets. Doubtless these sockets had hairs in them on emergence, which became removed in flight. In the forewing, in the central portion of the transparent area, much the same is to be seen, except that the hairs are distinctly stouter and larger, and deserve the term bristle much more than the hairs in the hindwing. On the edges of the transparent portion, the remarkable fact is revealed that the scales are transparent or semitransparent, and also smaller than the normal black or blue scales of the remainder of the wing, clearly indicating that, primarily, the hairs on the transparent patches were modified reduced scales, which later became semitransparent, and finally became bristle-like and hair-like. It may be well here to remark that, as in the former species, *Agyrta micilia*, the transparency of the forewing is at present effected by the scales still being reduced and semitransparent, while, on the hindwing only, the scales have developed further into bristles. It is reasonable to suppose that, in *Euagra cœlestina*, the transparency is an older phenomenon, with scales developed into bristles in both fore- and hindwings. This is also interesting as almost conclusively proving that, however strong one member of a Mullerian group may be at the present time, it by no means follows

that it was always so, and, although the *Agyrta* is now about five times as abundant as the *Euagra*, the latter must have had a start of the former in developing its transparent patches.

ESTHEMOPSIS SERICINA.—Unfortunately the only specimen available for observation has a considerable amount of fungus growth on it. The same general statement can, however, be made as with the other species, *viz.*, that the transparency apparently arose earliest in the hindwing, then in the central area of the forewing, and last of all in the apical patch. The normal shape of the scales is more or less rectangular, with irregular teeth at the upper end. In the transparent portions the scales have first lost the teeth, and have then become rounded at the upper end, and become shorter, and finally almost circular. But, as before, the normal scales evidently first became less closely packed together. Having become rounded the scales are seen to be transparent. The remarkable thing in connection with this insect's transparency is that there are two layers of scales, the one overlaying the other, and both have become transparent, the normal black scales being completely transparent and colourless, the overlapping blue scales having become bluish transparent. Some scales are to be found that are only partially transparent, the transparent portion being of the bluish tinge. It is likely, therefore, that these scales were black and blue, the latter portion having become changed only. Some of the scales of the cilia are two-coloured without any change to transparency.

IOSTOLA DIVISA.—In the cell of the hindwing the scales are transparent, and smaller than in the transparent portions of the forewing. They are long, and without any tooth-like projections, and are thinly distributed. In the transparent portion of the cell of the forewing the scales are still a considerable distance apart, and without tooth projections are quite transparent, and are also reduced in size, but scarcely so much so as in the hindwing. The dark, almost black, scales are usually tridentate, the plain, non-toothed, scale is, therefore, in all probability an advancement. Near the inner margin is a long streak of blue scales; these are semitransparent, or partly transparent, and generally have indications of being bidentate, though blunted considerably. The broad subapical transparent patch of the forewing has the transparent scales much less numerous than in the cell of the forewing, while the small apical patch shows the scales to be only semitransparent, and to be closely packed together, directly pointing to the latest and least development towards transparency. A ♂ and ♀ examined. The ♀ has the apical patch less developed than the ♂.

PSEUDARBESSA DECORATA.—Although not nearly so transparent as the other species, the interest attaching to the present instance is every bit as great, for here it is possible to guess pretty accurately the order in which the methods of obtaining transparency arose. To the unaided eye it is noticeable that the central portion of the hindwing, or that lying within the discoidal cell, is the most transparent portion. Under a $\frac{2}{3}$-lens the scales, which are all of the same shape, are more or less themselves transparent, and are spaced further apart than in the contiguous portions of the wing. In the semitransparent patches of the forewing the scales have arrived at the same degree of transparency, but are closely packed together, and this alone accounts for the very much less transparent look they have to the naked eye. It

would thus appear that transparency, or semi-transparency, of the scales, was here a prior development to the loss in number, and that the two processes were evolved at different periods of the species' existence. Although the end of the cell in the hindwing is almost completely transparent, the basal portion is a long way from that condition, but, on the underside, a greater development is to be found than on the upperside, many of the scales having there become semi-transparent, while in the same position on the upperside comparatively few are at all advanced.

The second special group of transparent-winged species is one made up of four Ithomiines of four different genera, *viz.*, *Napeogenes potaronus* (described in Appendix), n.sp., *Leucothyris zarepha*, *Ithomia florula*, *Heterosais sylphis*: two Erycinids, *Stalachtis phaedusa* and *Stalachtis evelina*: one Hypsid, *Lauron partita*: and one Geometrid, *Hyrmina protecta* (described in Appendix), n.sp. This group, as the last, has a particular interest, in that the various members are in widely different families. At the same time, the individuals all bear a remarkable similarity. The mode of scale-development to bring about this end is, as before, completely different in the different families, and slightly different in different genera within the same family. Each species of the group is detailed as follows:—

NAPEOGENES POTARONUS.—The normal scales are short and broad, and long and narrow alternately, and fairly closely packed together. In the transparent area the scales have developed into short hairs, but there is no reduction in the number, and on both fore- and hindwings there is no area denuded of everything.

† LEUCOTHYRIS ZAREPHA.—In this species, the normal scales are much the same shape as in the last, but they are larger. Here also the scales are of two shapes. Development has, however, gone on in another, though similar, direction, for each broad scale has, in the transparent areas, become a mere skeleton or outline, and the result is a V, composed of two bristles that originally formed the posts to which the membrane of the scale was attached. The long scales have become long bristles. In some cases the two bristles are stalked, and a Y-shaped object is the result. This may be taken, however, as simply the result of the normal scales being slightly variable, and not as any special subsequent development. On those portions of the wing that are contiguous to the transparent areas, a certain number of scales are to be seen in a transition state, having partly lost the membrane only.

ITHOMIA FLORULA. As in the last, the scales are of two shapes, but the long scales are difficult to detect in the unmodified portion of the wing. In the transparent areas, these long narrow scales have become stiff bristles, and these are much longer than the V- or Y-shaped hairs, and, consequently, brush off much more quickly. The Y-shaped hairs usually remain attached to the sockets, and are, in fact, to a certain extent, protected by the long single bristles, until all these have been removed. In addition to the scales becoming modified they also become greatly elevated, but, in all cases, the hairs and bristles become slightly curved, the Y-shaped ones in particular.

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† Two other species of *Leucothyris* have been since detected from the same locality, *viz.*, *L. flora*, and *L.* —? *n.sp.*

HETEROSAIS SYLPHIS.—The course of development is precisely the same in this Ithomiine, except that the modified Y- or V-shaped hairs are rather longer than in the last species. Where the dark opaque portion of the wing merges into the transparent area, the broad scales are seen to be considerably modified, while the long narrow scales are apparently as yet not in any way specialised, pointing to the fact that the broad scales, perhaps, commenced modification earlier than the others.

** STALACHTIS PHÆDUSA.—The means of obtaining transparency in this species is amazing in its complexity. In the normal scaling of the wings there are two superimposed layers; the underneath layer is composed of broad fan-shaped scales, with several teeth on the upper edge, and these lie flat down upon the membrane. A second layer of scales project through and over the first, and these are of elongated shape, and are a good deal set up on edge. In the transparent portions of the wing area the upper scales are all hair-like, while the lower broad scales have become transparent, and, in addition, appear to rub or wear off pretty easily, while the hair-like scales are very numerous, and do not to any extent wear off, unless it be after prolonged existence. A mediocre specimen examined did not show more than a few of these hair-like scales removed, but a great number of the transparent underneath scales were missing. On the inner margin of the hindwing there is hardly a trace of the transparent scales, and the portion nearest the apex has most. In the forewing also the region of the outer margin is best scaled.

STALACHTIS EVELINA.—In this species precisely the same process takes place as in the last, and the transparent scales are evidently very easily rubbed off, as, except in one or two places, hardly any of these are to be seen. On the underside the broad costal half of the wing, which is black on the upperside, is developing towards transparency, and the major portion of the flat scales have become transparent, there being still some scattered dark scales amongst them.

LAURON PARTITA.—From the very incomplete transparency of this species one surmises that it has probably developed the tendency later than any other individual of the group. The scales are of two shapes, and are arranged alternately. In the opaque portions of the wings these two scales are long and slender and short and slender respectively, and are pointed rather abruptly at the tip. In the transparent areas both sets of scales have become much narrower, but not hair-like, and are raised slightly above the membrane. Hardly any reduction in numbers, if any, has taken place, and, altogether, the transparency is most incomplete. The small scales, besides their altered shape, have lost some of their pigment, but the larger scales show no development whatever in this direction.

HYRMINA PROTECTA.—The scales of this species are extremely varied, some are rather long and pointed, others are short and pointed, while some are broad and either dentated or not. In the transparent areas simple bristles are alone visible; a few are considerably longer than others, but none are bifurcated as in the Ithomiines. There is no reduction in the number of scales.

It will be seen from these results that the most common and usual

** A third *Stalachtis*, *viz.*, *cephalena*, has since been added to the group.

method of producing transparency is by a simple process of modifying the scales into hairs. In the *Ithomiinae*, where transparency is so general, one forms the opinion that this is brought about by a common cause. That cause is probably for effacive coloration, as these insects are wonderfully inconspicuous at a very short distance. With the prime *raison d'être* being the same, one would expect the method of obtaining it to be the same, and an examination of many different species in different genera shows this to be so. In the genera *Leucothyris*, *Ithomia*, *Scada*, *Episcada*, *Pteronymia*, *Heteroscada*, *Hyposcada*, *Hymenitis*, *Heterosais*, *Calloleria* and *Ceratinia*, all the species examined show that there are two different-shaped scales, placed alternately, (1) a long unindented scale, and (2) a broad toothed scale. Where a species has developed perfect transparency, such as *Hymenitis dircenna* or *Ithomia pellucida*, the long narrow scale has developed into a single hair, and the broad scale has developed into a Y- or V-shaped structure. Other less developed transparent species show that the Y or V is in reality the shell only of the broad scale, as the membrane, so to speak, has receded until only the frame is left. Certain species, such as *Scada theaphia*, have the scales completely modified in this manner, but have not lost any of their number, and only semi-transparency is afforded in this way. In *Ceratinia*, such as in the ♂s of *C. tricolor* and *C. euclea*, the long narrow scales are completely developed, while the broad scales have only commenced development by shrinkage of the membrane of the scale. In *Hymenitis dircenna*, *Ithomia pellucida*, and, probably, in all the genera where the scales are sufficiently modified, it is remarkable that only the single hairs, or modified narrow scales, come off, while the double or bifurcated hairs remain in position. Although outside the strict sphere of this paper, I should like to say that this alternate long and narrow, and short and broad scaling, is probably a thoroughly sound character on which to diagnose an Ithomiine, as even in *Methona confusa* and *Thyridia psidii*, very different-looking insects, the scaling is the same.

In marked contrast with the Ithomiines are the transparent Erycinids. We have already examined *Esthemopsis sericina*, and found that there are two layers of scales, each of which is transparent. We have examined the *Stalachtis* species, *Sphaedusa* and *S. evelina*, and found that there are two layers of scales, the upper of which develops into hairs, and the lower into transparent scales. In the genera *Zeonia*, *Z. sylpha* and *Z. chorineus* show that there is only one shape and one layer of scales, that these become greatly reduced in size, and very greatly reduced in numbers. With these facts in view we may ask ourselves if our classification of these genera into one family is on a sound basis.

It has, I fear, been quite impossible to do more than touch on a subject that is as vast as it is fascinating. I, however, hope that I may have stimulated other entomologists to work at this subject, as I know there are many willing shoulders anxious to push forward the wheel of research.

APPENDIX.

NAPEOGENES POTARONUS, N.SP.—Forewing black and transparent. A large heavy black band from costa across the end of cell nearly to the marginal black band. Costa black, except just beyond the median band, where it is white. Apex broadly black with traces of some whitish marks. Inner and outer margins black, the remainder of the

wing transparent. Hindwing in ♀ with the costa to the end of the cell pale brown, thence to margin dark brown suffused with blackish, in ♂ wholly blackish-grey. Outer margin broadly black, containing a band of varying width of umber-brown. Occasionally the inner band is extended round to meet costa, but more often is very faint or absent beyond nervure 4. At apex are one or two faint traces of whitish or greyish marks as in forewing. Collar and front edge of patagia dull red. Underside of both wings similar to upperside, except that within the heavy black bar of the forewing is a band of light brown, and a band of similar colour within the black marginal band. Three apical white spots are quite distinct. In both ♂ and ♀ the underside of the costa of hindwing is pale brown, like the inner band before the outer margin. Three distinct white apical marks and indications of some others. Exp. 44mm. Habitat, Potaro river, British Guiana.

HYRMINA PROTECTA, N.SP.—Forewing black and transparent. Costa, inner margin, outer margin, and apex broadly black, the last particularly so. A broad black band from costa, beyond cell to marginal black band, enclosing a curved longitudinal transparent space. The nervures within the transparent area, between the transverse band and inner margin, heavily covered with blackish scales. The dark scales extending well beyond the nervures. Hindwing transparent, the costa and outer margin broadly black. The nervures clothed with dark scales within the transparent area. Head with frons, bases of antennæ and prothorax with white spots. Front edge of patagia with dull red spots. Exp. 38mm. Habitat, Potaro river, British Guiana.

EXPLANATION OF PLATE III.

FIG.				
1.	*Euagra coelestina*	SYNTOMIDÆ	Sect. I.	Group I.
2.	*Cyanopepla chelidon* ..	,,	Sect. I.	Group I.
3.	*Pseudarbessa decorata* ..	? GEOMETRIDÆ	Sect. I.	Group I.
4.	*Agyrta micilia*	SYNTOMIDÆ	Sect. II.	Group I.
5.	*Esthemopsis sericina* ..	ERYCINIDÆ	Sect. II.	Group I.
6.	*Iostola divisa*	HYPSIDÆ	Sect. II.	Group I.
7.	*Heterosais sylphis* ..	ITHOMIIDÆ		Group II.
9.	*Leucothyris zarepha* ..	,,		Group II.
11.	*Ithomia florula*	,,		Group II.
13.	*Napeogenes potaronus*, n.sp.	,,		Group II.
8.	*Hyrmina protecta*, n.sp...	GEOMETRIDÆ		Group II.
10.	*Stalachtis phaedusa* ..	ERYCINIDÆ		Group II.
12.	*Stalachtis evelina* ..	,,		Group II.
14.	*Lauron partita* ..	HYPSIDÆ		Group II.

Some Notes on Collecting in Syria—Ain-Zahalta and Jebel-Barouk, 1904.

By PHILIP P. GRAVES.

(*Concluded from* p. 57.)

I arrived at Ain Zahalta on July 10th, 1904, after three hours' train, amidst fine mountain scenery, and three and a half hours' drive up and down hill, amid great ridges looking like overgrown south downs after a drought, but stonier by far. On all these heights *Melanargia* var. *teneates* flew with *Satyrus telephassa*, worn *Thymelicus lineola* and *Pararge megaera*, and numerous *Polyommatus icarus*. Zahalta itself is a village built on the terraced sides of a hill, some

4000 feet above sea-level, and about 700 feet above the valley, where a clear and cool river flowed. In the river valley and above it, in places, were copses of plane, sycamore, a species of poplar and prickly oak, with an undergrowth, dense in parts, of bramble, St. John's wort, hawthorn and rhododendron. Springs above the village and winter rains had worn "wadis" on the hillside, which were full of vegetation. The open hill slopes were dry and covered with boulders. Thistles, and a host of aromatic plants, abounded, notably basil, a species of thyme, mint and hyssop. Above the village was a precipitous height, whose western face fell almost sheer, covered with boulders and rocky outcrop, and abounding in broom. On the top of this hill was the tent hotel, where I was bound, on dry ground in an open pine wood. Above the whole valley, on its eastern side, was the stony mass of Jebel Barouk (7284ft.), crowned with cedars. The western side of the valley, across the river, and many of the eastern slopes, were covered with open pine wood, in which were numerous dry sandy clearings. In many places there was a limestone outcrop, and the red soil—decomposed sandstone, was never apparently very deep. Though late in the summer, for Syria, flowers were by no means over. A white scabious attracted many butterflies, as did the broom and the clovers, which grew in all well-watered places.

The first insect that I took was a large ♀ *Satyrus hermione*, from a pine outside my tent, and a somewhat worn *Papilio podalirius* followed. *Epinephele lycaon* was common in the woods, a rather large form, the ♂ heavily furred with the discoidal streak well marked, darker than the figures of *E.* var. *lupinus*, and probably referable to var. *intermedia*. *Chrysophanus phlaeas* swarmed in all the pine woods with *Polyommatus icarus*. *P. astrarche* was more common on the lower slopes, especially in some sandy clearings a little way above the river. It answered to the description of g.a. *calida*, the red spots being large, the colour dark, and the ground tint of the underside a rich brown. *Coenonympha pamphilus* occurred commonly only on the hotel hill. The specimens I have are mostly of the ab. (or var.) *thyrsides*, with from two to four spots on the upper side of hindwings, one or two answer more nearly to var. *marginata*. A few *Melanargia* var. *teneates* visited the scabious, but all, except three which I took, were sadly worn. Otherwise the insect was common enough on the down-like slopes above and opposite the village, and I took torn specimens within a thousand feet of the summit of the Barouk range.

My first expedition was to a watercourse at the foot of the steep face of the hill, which I often visited subsequently. On the way down *S. telephassa* occurred in great abundance. It retired to rest at mid-day, in little caves in the cliff, or under overhanging boulders, from which multitudes emerged together. With it I took a few *S. anthe* var. *hanifa* ♀s, which had the same habits as *S. telephassa*, and were quite different in flight from the wild males. *S. telephassa* was, unluckily, not at its best, and appears to be horribly apt to "grease," but I have seldom seen a butterfly more numerous. *Pararge megaera*, mostly worn, occurred with these species, and was usually of a very pure ash-grey colour on the underside of the hindwings (var. *lyssa*, I suppose), while a fine form of *Polyommatus icarus* was everywhere. The ♀ *icarus* were all of the brown form. A solitary ♀ of *Chrysophanus dorilis* var. *orientalis*, much worn, and a ♀ *Thecla spini* var. *melantho*,

were taken below the hotel hill, while very worn *Adopaea lineola* occurred here and there. A few *Limenitis camilla*, fresh, and apparently of the second brood, occurred in bushy places, and with them I got *Gonepteryx cleopatra* var. *taurica*, but never in good condition.

Of other insects *Pontia daplidice*, *Pararge moera*, *Melitaea trivia* and *Satyrus pelopea* emerged shortly after my arrival; the first two species were small as a rule. *P. daplidice* occurred very frequently up to about 4500 feet, while *M. trivia* was local, frequenting open gravelly banks and clearings in the pine woods. *Pararge moera* was fairly common everywhere, but *S. pelopea* occurred most commonly in dry rocky places, and settled as a rule on the ground, where its underside coloration made it very hard to distinguish. I only took one *Satyrus fatua* var. *sichaea*, and saw two others when I was in difficulties on impossible ground, and so cannot say much about its habits. Two of the three I saw alighted on pinetrees, as did *S. hermione*, which occurred in numbers in the pine woods. *S. telephassa* var. *anthe* rested as a rule on grey granite rocks and boulders, while *S. pelopea* was fondest of patches of brown or reddish soil, overhung by boulders or ledges of rock. Of the "skippers," *Syrichthus orbifer* and *S. tessellum* var. *nomas* occurred in most places, and in a small but thick wood in the valley I got a couple of good specimens of *Augiades sylvanus*, which appeared to approach var. *anatolia*. *Parnara nostradamus* occurred, but was as worn as usual.

Jebel-Barouk, or rather the end of the range known by that name, which overlooked Zahalta from a height of 7000 feet, seemed to be too barren and stony, despite an open cedar wood, to promise much, but, in crossing the mountain, while on an expedition to the Litani or Leontes river, I saw and took enough to bring me to the summit on July 21st and 24th. The expedition to the Leontes revealed little entomologically, as far as the B'kaa or valley between the Lebanon and Antilebanon was concerned. On this excursion, my companion and I nearly died of heat and thirst, the valley being at this season one of the hottest and driest places in Syria, and the Litani's waters were absolutely undrinkable. I recognised *Polyommatus lysimon* there, and one battered *Papilio podalirius*, but, in my condition, to catch an insect was impossible, and so *P. lysimon* ought, I think, to be marked with a query, though my acquaintance with the insect is considerable.

To return to the mountain! At a height of some 6500 feet was a ravine, opening into a cup-shaped depression, partially planted with corn by energetic Druses, surrounded by cedars and dotted with clumps of buckthorn, prickly oak, elder, and one or two other bushes unknown to me, and not destitute of flowers. Up here, insects were numerous as far as species went, but a long series of anything was unobtainable, and many species were torn or worn, or both. Among these were *Chrysophanus thersamon*, *Dryas pandora*, *A. lineola*, and a blue which I named, with hesitation, *Polyommatus candalus*. A burnet, *Zygaena ?* sp., occurred pretty frequently on the elder blossom, and *Polyommatus anteros* var. *crassipuncta* and *P. panagea*, mostly ♀ s, were abundant.

On the 21st I took a lovely specimen of *Plebeius loewii*, uncommonly like my *allardii* from the Egyptian desert ravines, in spite of so different a habitat, and a fine *Chrysophanus ochimus*. Fresh ♂ s of both these beautiful species were to be had on the 24th. No ♀ s, and

I deduced, wrongly perhaps, a second brood. Speaking of second broods, I took specimens of *P. admetus* var. *ripartii* on each of these expeditions, and, on July 28th, took two fresh ♂s close on 8000 feet below, at a spot near Zahalta, which I had worked almost daily without seeing the insect. One *Chilades trochilus*, very small, but unfit for the cabinet, and multitudes of worn Theclas (apparently a small form of *T. ilicis*) were interesting finds. I took *Cyaniris argiolus*, worn too, a little below the cup-shaped depression, and some fine *Issoria lathonia* and *Polygonia egea*, with dark undersides, unlike the low country specimens. But the most interesting takes were *Polyommatus meleager*, two ♂s, and a variety of *Augiades comma*, with confluent creamy-white spots on the underside of the hindwings (one only), this I took to be var. *pallida*. In a little depression full of flowers, above the main cup, I took three fresh *Melitaea* var. *caucasica*, like my specimens of *deserticola* from Egypt, but with whitish spots on the apical costa of the forewings. The mountain-top was a mass of rock, but none the less produced a few *E. lycaon*, small, and rather yellowish in colour, near the description of var. *libanotica*, *Syrichthus tessellum* var. *nomas*, and numerous specimens of a *Colias* which, alas! proved to be merely *edusa*. I had hoped to get *Colias libanotica*, but a single ab. *helice* was the most remarkable *Colias* I saw on the mountains. My trip was, of course, too short and too late in the year, but I took or saw 61 species, and hope in another season to make good use of my experience.

The following are among the butterflies I took or recognised:—*Papilio podalirius*, *P. machaon*, *Pieris brassicae*, *P. rapae*, *Pontia daplidice*, *Leucophasia sinapis*, *Idmais fausta*, *Colias edusa* and ab. *helice*, *Gonepteryx cleopatra* var. *taurica*, *Danais chrysippus*, *Dryas pandora*, *Issoria lathonia*, *Melitaea phoebe*, *M. triria*, *M. didyma* var. *caucasica*, *Pyrameis cardui*, *P. atalanta* (one seen), *Polygonia egea*, *Limenitis camilla*, *Melanargia teneates*, *Satyrus hermione*, *S. fatua* var. *sichaea* (one), *S. anthe* and ab. ♀ *hanifa*, *S. telephassa*, *S. pelopea*, *Yphthima asterope*, *Epinephele lycaon* var. *intermedia*, *Pararge megaera*, *P. maera* var. *orientalis*, *Coenonympha pamphilus* var. *thyrsides*, *Thecla spini* var. *melantho* (one), *Thecla ilicis*, *Chrysophanus thersamon* g.a. *omphale*, *C. ochimus*, *C. phlaeas* g.a. *eleus* (or aproaching it), *C. dorilis* var. *orientalis* (one), *Cigaritis acamas*, *Lampides boeticus*, *L. jesous*, *Chilades trochilus*, *Plebeius lowii*, *Polyommatus panagaea*, *P. lysimon* (?), *P. anteros* var. *crassipuncta*, *P. astrarche*, *P. icarus*, *P. candalus* (?), *P.* (*Plebeius*?) *nicholli* (worn ♂s, at 6500 feet-7000 feet only), *P. meleager*, *P. admetus* var. *ripartii*, *Cyaniris argiolus*, *Adopaea lineola*, *Augiades sylvanus*, *A. comma* var. *pallida*, *Panara mathias*, *P. nostradamus*, *Carcharodus alceae* f.a. *australis*, *C. altheae* (two), *C. lavateraе*, *Syrichthus orbifer*, *S. tessellum* var. *nomas*, making a total of 61 species, of which 21, or more than one-third, were Lycænids. The same large proportion of Lycænids is to be noticed in my Egyptian lists, where 8 species out of 24 taken or seen by me, in that very poor country for butterflies, belong to that group. On the other hand, I have not seen a single Satyrid in Egypt, while in Syria I took eleven species, and know that many more occur.

Synopsis of the Orthoptera of Western Europe.

By MALCOLM BURR, B.A., F.L.S., F.Z.S., F.E.S.

(*Continued from* p. 95.)

7. Stauroderus apicalis, Herrich-Schäffer.

Size large; body pilose; colour pale olive-green; pronotum with indistinct dark bands, the carinæ very little bowed; elytra pale, subpellucid, uniform colour in ♂, faintly spotted with black in ♀, with a yellow line in the scapular area; elytra surpassing abdomen in ♂, but not in ♀, the scapular area of ♂ dilated; wings hyaline, faintly smoky at apex; hind tibiæ yellow. Length of body, 20mm. ♂, 25mm. ♀; of pronotum, 3·5mm.-4mm. ♂, 5mm. ♀; of elytra, 13mm.-15mm. ♂, 17mm. ♀.

Occurs throughout the Iberian Peninsula. In Spain, it occurs in Andalusia, at Granada, and in the neighbourhood of Madrid adult from May. In Portugal, at Coimbra, Condeixa, and Leiria. It is found also in Greece.

8. Stauroderus vagans, Fieber.

Resembles the following abundant species; distinguished by the position of the typical sulcus of the pronotum, which is in the middle in this species; also by the rounded hinder border of the pronotum, and the less dilated scapular area of the elytra of the ♂, and the less hairy sternum. Length of body, 13mm.-15mm. ♂, 20mm.-22mm. ♀; of pronotum, 2·8mm.-3mm. ♂, 3·3mm.-4mm. ♀; of elytra, 11mm. ♂, 14mm. ♀.

Locally distributed in Central Europe. In Belgium, it occurs at Fauquemont, Poilvache near Yvoir, Spa, and Tonnelet. In France it is commonest in the south: Hyères, Montpellier, Cannes, Fréjus, Cauterets, Arcachon, Cazau, Lamothe, La Teste-de-Buch, Arcy, Marseille, Draguignan, Sainte-Baume, Vaucluse, les Ramillons, Chantilly, Creusot, Lorraine, Biche, Bagnols, Dunquerque, le Rayru, and Francheville near Lyon; it is also recorded, though doubtfully, from Jersey. In Spain, it is common throughout the summer all over the country. In Portugal, it is recorded from Vallongo, Foz do Douro. In Germany, it is noted from Thuringia, and, in Austria, from Baden near Vienna. In Switzerland, from Freiburg, and the Valais. In Italy, at Voltaggio, Trient.

8a. Stauroderus finoti, Saulcy.

A doubtful and very little known species; said to differ from the preceding by shorter organs of flight and sharper angle of carinæ of pronotum. Length of body, 16mm. ♂, 21mm. ♀; of pronotum, 3·5mm. ♂, 4·2mm. ♀; of elytra, 8·6mm, ♂, 10mm. ♀.

Recorded by de Saulcy from Canigou, in the Pyrenees, in September.

9. Stauroderus biguttulus, L.

Very closely allied to the following species, with which it was confused by the early authors; the marginal vein of the elytra is much stouter in the ♂, and more strongly bowed; there is a very distinct spot at the juncture of the radial vein with the marginal vein; the scapular area is much more dilated, with thicker fenestrations and more regular; the ♀ has the transverse veins of the scapular area waved and not confluent. Length of body, 13·5mm.-15mm. ♂,

17mm.-22mm. ♀; of pronotum, 3mm.-3·2mm. ♂, 3·8mm.-4·5mm. ♀; of elytra 12mm.-14mm. ♂, 15mm.-18mm. ♀.

Widely but locally distributed in northern Europe. It has not yet been recorded in Britain, but it is noted from Scandinavia. In France, it is common in the centre and north: Boulogne-sur-mer, Fontainebleau, Malesherbes, Épisy, Bourray, Lardy, Cauterets, Amélie-les-Bains, Monte-Dore, Montreuil-Bellay, Ile de Ré, Saint Mammes, Pouligueu, Coulanges, Vincelles, Noirmouthiers, Nantes, Pornic, Soissons, Saint-Genis-Laval, Allier, Senlis, Le Blanc, Creusot, Valenciennes, and Lyons. In Belgium, it is common at Condroz, Limbourg, Arlon Spa, Campine, Charleroi, Rouge Cloître, Hesbayenot. In Spain, it is quoted from Gayangos, Barcelona, and Parga, and in Portugal at Condeixa. Search will probably record a large number of new localities.

10. Stauroderus bicolor, Charpentier.

Extremely variable in colour; green, red, purple, yellow, grey, brown, or black; this is the most abundant and generally distributed European grasshopper, and is met with nearly everywhere, in a variety of colours; the student would do well to capture a number of its varieties and carefully note the identity of structure and use this species as a starting-point for the determination of others; it is most likely to be confused with the preceding species, but may be known by the characters mentioned in the table.

Length of body, 15mm.-16mm. ♂, 19mm.-24mm. ♀; of pronotum, 2·5mm.-3·8mm. ♂, 3·8mm.-4·8mm. ♀; of elytra, 12mm.-16mm. ♂, 16mm.-21mm. ♀.

Excessively common throughout Europe; Norway, Sweden, Lapland, Denmark, England, Scotland, Ireland, Holland, Belgium, France, all over Spain, Portugal, Switzerland, Germany, and Austria.

For the minute distinction of the two species, cf. Krauss. *Beitrage zur Orthopt.-Kunde*, I.

Genus X: Chorthippus, Fieber.

Bolivar restores Fieber's name for Brunner's fifth group of *Stenobothrus*, characterised by the nearly parallel carinæ of the pronotum and short and dilated mediastinal area of the elytra.

Table of Species.

1. Large (♂ 20mm.-24mm., ♀ 33mm.-36mm.). Uniform green, with red posterior tibiæ .. .. .. 1. jucundus, Fisch.
1.1. Smaller species; colour variable, often green, with hind tibiæ pale, blue, or reddish-yellow.
  2. 3rd radial vein of elytra entire; subgenital plate of ♂ pointed backwards; colour pale, sometimes with darker longitudinal stripes .. 2. pulvinatus, F. de W.
  2.2. 3rd radial vein of elytra forked; subgenital plate of ♂ pointed upwards; colour generally green
    3. Organs of flight well-developed in both sexes; posterior femora uniformly coloured.
      4. Carinæ of pronotum almost straight; 2nd radial vein of elytra somewhat thickened and bent in middle, and 3rd angled in middle and bent backwards .. .. 3. elegans, Charp.
      4.1. Carinæ of pronotum slightly bowed; 2nd radial vein straight, not thickened, the 3rd not angled .. .. 4. biorsatus, Zett.

3.3. Organs of flight abbreviated in ♀; elytra well developed in ♂, lobiform in ♀; wings rudimentary.
4. Typical sulcus of pronotum nearer to hinder border; valves of ovipositor short; axillary vein of elytra ♂ not confluent with middle of anal vein .. .. 5. PARALLELUS, Zett.
4.4. Typical sulcus of pronotum in middle; valves of ovipositor noticeably longer than in preceding species: axillary vein ♂ confluent with middle of anal vein .. 6. LONGICORNIS, Latr.

1. CHORTHIPPUS JUCUNDUS, Fischer.

Easy to recognise by its uniform green colour, with red hind tibiæ, and large size; it hardly appears to belong to this genus. Length of body, 24mm. ♂, 31mm. ♀; of pronotum, 5mm. ♂, 7mm. ♀; of elytra, 20mm. ♂, 26mm. ♀.

A southern species; in France it is rare; Montpellier, Serres, Montelimar, Drôme, Saint Angulf, Ponds of Villepey, Var. In Spain, common in high grass and herbage near rivers throughout the country, especially the south and centre. It probably occurs throughout Portugal, and is recorded from Serra de Estrella and Panacova.

2. CHORTHIPPUS PULVINATUS, Fischer de Waldheim (=*declivis*, Brisout).

Extremely variable in colour; length of elytra and wings exceedingly variable; they are better developed as a rule in southern than in central Europe. It may be known from its allies by the large head of ♀, the straw-yellowish colour, with darker stripes, which begin from the eye and run down the sides of the pronotum down the elytra; the third radial vein of elytra is unforked in both sexes; the long subgenital plate of the ♂ is also characteristic. Length of body 15mm.-19mm. ♂, 19mm.-25mm. ♀; of pronotum, 2·8mm.-3·4mm. ♂, 3mm.-5mm. ♀; of elytra, 8mm-13·5mm. ♂, 9mm.-16mm. ♀.

In France, commonest in the south and central, recorded as far north as Fontainebleau, and very many localities in the central and south; it is adult from July to December throughout Spain and Portugal; in Switzerland, at Geneva, and probably elsewhere also; in Austria, and in Italy, common in the north in August and September. It is also doubtfully recorded from Jersey.

Azam records a var. *gracilis* of slenderer build and greyish-red colour from Clermont-Ferrand, France.

3. CHORTHIPPUS ELEGANS, Charpentier.

Greyish-testaceous, or green; allied to *C. dorsatus*, but of slenderer build; differs as shown in the table; the most important point is the venation of the elytra. Length of body, 13mm. ♂, 18mm. ♀; of pronotum, 2·5mm. ♂, 3·8mm. ♀; of elytra, 10mm. ♂, 13mm. ♀.

Locally distributed in Central Europe. In Sweden, recorded from Öresund near Lomma, Esperöd, Österjön, Uddevalla, and in Denmark from Nordsjön; in England, from Deal, the New Forest, Freshwater, the Cambridgeshire Fens; in Belgium, from Blankenberghe, Ostend, Wienport, Panna, Campine, Diepenbaeck, and Arlon; from Germany, at Berlin; in France, at numerous localities, though nowhere common, Paris, Saint Questin, Lartoire, Barèges, Toulouse, Allier, Le Blanc,

Calvados, Lamothe, La Teste-de-Buch, Cazan, Épisy, Pouliguean, Ile de Noirmoutiers, Nantes, Granville, Fontainebleau, Meudon, Wimereux. In Spain it appears to be rare, being only recorded from Ferrol, Chiclana. In Austria it is found at Mödling, the Prater, Oberweiden, and Brück.

It chiefly frequents dry sandy places, but is also found in swampy fields.

4. CHORTHIPPUS DORSATUS, Zetterstedt.

Closely resembles the preceding, but is of a stouter build, more generally green in colour, and differs in the venation of the elytra. Length of body, 14mm.-18mm. ♂, 19mm.-26mm. ♀; of pronotum, 3mm.-4mm. ♂, 4mm.-5mm. ♀; of elytra, 10mm.-14mm. ♂, 10mm.-21mm. ♀.

Common in northern and central Europe; in France it is common, and recorded from numerous localities; it is rare in the south, recorded from Tarbes and the Riviera. It is not known in Britain, but recorded in Belgium from Barraque, Michel, Genck, and Laeken. In Scandinavia it is noted from Skane, Småland, Bohuslän, W. Gottland, Stockholm, and Gottland, Esperöd, Abusa, Fogelsång, Ofvedskloster, Lund, and Finjasjön. In Spain it is recorded only from Collsacabra in northern Catalonia.

5. CHORTHIPPUS PARALLELUS, Zetterstedt.

Green; knees black; antennæ long; wings abortive; elytra extend to apex of abdomen in ♂, abbreviated and lanceolate in ♀. Length of body, 14mm.-16mm. ♂, 18mm.-21mm. ♀; of pronotum, 3mm. ♂, 3·8mm.-4mm. ♀; of elytra, 8mm.-14mm. ♂, 6mm.-16mm. ♀.

The dimensions show that the organs of flight are occasionally fully developed, but this variety is quite rare.

It is common throughout Europe, chiefly in damp fields. It occurs in Lapland and Norway, Sweden and Denmark. In Britain it is abundant in nearly all fields, and in France also. It is abundant in Belgium, and common throughout Spain and Portugal.

A very large and pale coloured variety is recorded by Brunner from Malaga, which attains 20mm. in the ♂, and 30mm. in the ♀.

6. CHORTHIPPUS LONGICORNIS, Latreille.

Very closely allied to the preceding, and doubtless often confused with it; distinguished by the somewhat longer antennæ, by the transverse sulcus being in the middle of the pronotum, by the long valves of the ovipositor, which are very noticeable; axillary vein of the ♂ elytra is confluent in the middle with the anal vein. Length of body, 14mm.-15mm. ♂, 17mm.-21mm. ♀; of pronotum, 3mm. ♂, 3·5mm.-4mm. ♀; of elytra, 8·5mm.-9mm. ♂, 7mm.-8mm. ♀.

The organs of flight are generally better developed in this than in the last species, and it is more likely to be confused with the fully-winged form of the latter.

It is common in swampy fields in central France; Fontainebleau, Épisy, Malesherbes, Nemours, Loiret, Lamothe, Arcachon, Fontevrault, Montreuil, Amélie-les-Baines, Draguignan, Essonne, St. Cyr. It is recorded from Laeken near Brussels. It is not yet known in Britain.

outside the discoidal area, similarly centred on the upper- and underside. Here too *Argynnis aglaia* was frequent, and *Erebia ligea* then became abundant; but the sun disappeared and the butterflies became rarer and less frequent, until at last we were driven to picking up *Anthrocera achilleae* and *A. transalpina* from the flowers, these species and *A. carniolica* and *A. filipendulae* having been with us almost since our start. A moment's sun discovered *Erebia pitho* to us, the males very dark, with scarcely any trace of fulvous about the ocellated spots of the forewings, and with three well-marked, faintly ringed spots on the hindwings. Lunch at the inn on the top of the Col occupied some time, as it remained dull, but then the sun came out for a while, and, in a meadow at the back of the inn, *Erebia euryale* was not rare, but the ♂ s were worn, and a grand form of the ♀ s, beautifully banded with white and brown on the undersides of the hindwings, were few and far between. *Cupido minima* and *Brenthis ino* were also here, in none too good condition, and then the sun went in again, and we slowly walked back to Gex. Among other things *Adscita geryon*, *Nemotois scabiosellus*, and *Adkinia bipunctidactyla* were taken on the scabious flowers. *Dasydia obfuscata*, *Cinophos glaucinaria* (?), and *Larentia ribicaria* were disturbed from the rocks, whilst *Euthemonia russula*, *Acidalia macilentaria*, *Pseudoterpna pruinata*, *Stenoptilia pterodactyla* (*fuscus*), *Pyrausta ostrinalis*, and *Eupoecilia* sp.? were disturbed from the herbage. A few Depressariid larvæ in the heads of the wild Umbellifers completed the bag.

The second visit to Gex took us to different ground. On July 30th, with Professor Blachier, his brother, and Mr. Muschamp, we took this time, instead of going on through the village, and so to the road that leads to the Faucille, a sharp turn to the left that led into a country road, at the foot of the lowest Jura slopes, up which, after some minutes, we slowly climbed as we entered a by-path and left the road behind. The lower ground looked little better than pasture-land, but, higher up, the slopes bore more resemblance to our Kentish downs, whilst higher still the bushes formed into woods, the paths through, and openings into, which were brilliant with the autumnal flowers of the district. This was butterfly ground indeed, difficult to make progress through because of the wealth of its fauna. The insect of the slope was *Melitaea parthenie*, and, as I meant business now that the chance offered, I took my series from this locality. I dare not say how many examples I netted, but when the final rejections had been made I set about 100 first-class individuals that I had captured. I feel vaguely indifferent on this group to specific distinction. I dare not say I do not know *M. parthenie*, as a matter of fact, when I tie my brother collectors down to facts and descriptions, I find that I am even clearer than they; nor dare I say that I do not know *M. athalia*, since we have been personally acquainted for the last 35 years, and I have seen, possibly, a few thousands on the wing. Strangely enough I know they are distinct species, their habits, habitat, and *tout ensemble* proclaim them such. I know now that my autumnal Gresy-sur-Aix *athalia* (so recorded) are *parthenie*, but, for the life of me, if they were offered me individually, I guess I should name half wrongly. We Britishers must work out this business somehow, even if we have not the double brooded *parthenie* in Britain, and have to insist that Messrs. Wheeler, Muschamp, and Sloper, in spite of residential quali-

fication, belong to our side. On these slopes, too, were the Savoy form of *Melitaea didyma*, the ♀s bright but small, and as different in size from the magnificent Spanish race, whose colour they follow, as from the mountain form, with which they have little in common in this particular. A few *M. cinxia* and a single *M. phoebe* were also on the wing, whilst *Anthrocera carniolica*, in splendid variety, hung in vain from the flower-heads, there being so little leisure to examine them, whilst *A. achilleae* was also abundant, though going over. I was very pleased to take, however, three *Anthrocera jucunda* (*genevensis*) here, a previous record of its existence on this line of the Juras having been subjected to some degree of doubt. Mr. Blachier took a single example, and the four were at any rate sufficient to satisfy us of its occurrence, if not altogether satisfactory from the collector's point of view. Evidently we did not hit its stronghold, and one must pass the quarries a considerable distance one supposes to reach its headquarters. *Polyommatus corydon* and *P. astrarche* were the abundant Lycænids, although a single *Cupido sebrus* ♀ was captured, and second-broods of *Nisoniades tages* and *Syrichthus alveus* were on the wing. Plenty of *Colias hyale*, and a few *Hipparchia briseis* were out on the slopes, but in the wooded boskies the accumulation of specimens was marvellous. Thousands of *Enodia dryas*, great black fellows, dwarfed the equally abundant swarms of *Erebia aethiops*, whilst *Pararge maera*, *P. megaera*, *Epinephele lycaon*, and *E. tithonus* were only less common; *P. egeria* was scarcer, but *Epinephele ianira* stood on each other, and on everything else, to get at the flowers, so abundant were they. Large *Pieris rapae* and *P. napi* also swarmed, whilst *Gonepteryx rhamni* was not infrequent. I stirred up *Toxocampa craccae*, and I remember lots of *Ematurga atomaria* (second brood) getting up everywhere. What other insects there were I know not. I lost account of time and place. I filled my boxes and used up all my pins, lost my companions, and—in spite of it all—was happy. What worry I gave them to find me I knew not, and cared less, but when I came on them, and found they had lunched and drank, I began to wonder what the time was as the end of the afternoon was near, so that Muschamp and myself went off to the cottages, a quarter of a mile below, and drank the local wine and ate the local bread and cheese, till nature was satisfied. That I missed two fine *Euvanessa antiopa* on the way back was not due, as was mildly suggested by my companion, to the fact that I had lunched, but to the excitement and heat of the day, for that day was hot, and when we got back a similar protest, that I could not hope to take all the *parthenie* on the slopes and get to Gex in time for the train, was sufficient to keep me on the move. It was a lovely day. When will our City of London and South London Entomological Societies unite to arrange a field-meeting to such a place, where nature is alive and seething? How many British lepidopterists would join to make a party if arrangements were made, and an interpreter provided to look after matters, and leave them free to hunt?

On July 27th, a turn after larvæ of *Turneria hippophaes* ended in failure, so far as obtaining the desired larvæ was concerned. A marsh by the side of the Arve, about a mile or so before it enters the Rhone, covered by thickets of *Hippophae rhamnoides*, sallow and alder, appeared to be a veritable fortress for the retreat of this local and beautiful species. Careful search, however, on the part of Mr. Muschamp and

myself, failed to reveal the desired species, for which we were, perhaps, a little too early, but as I picked up a nice series of *Enodia dryas*, which was very abundant among the long grass and bushes, I was not altogether disappointed. I was surprised to find *Euthemonia russula* and *Ematurga atomaria* abundant in this spot, where *Lomaspilis marginata* and *Pararge egeria* appeared to be more at home. But the most interesting captures of the afternoon were *Crambus alpinellus* and *C. sylvellus*, single specimens only, the ground evidently wants working at dusk, and in a fallow field on the borders of the marsh, where *Acidalia ornata* and *Pyrausta punicealis* were common, a single example of the true *Crambus contaminellus*, a typical specimen such as might have come from the Deal sandhills, Shoeburyness, or Blackheath, occurred. This also is a dusk flier, and hence wants working for later in the day. In the fields, *Pontia daplidice* was not uncommon but worn, and *Colias hyale* much more abundant than *C. edusa*. There were some interesting Odonata here. One abundant little species interested me sufficiently to bring away specimens.

(*To be concluded.*)

NOTES ON COLLECTING, Etc.

DASYCAMPA RUBIGINEA IN THE NEW FOREST.—I was in the New Forest last week end with Messrs. Colthrup and Lyle, sallowing, and had the luck to take a fine ♀ *Dasycampa rubiginea*, which I hope will oblige with ova. The capture may be worth recording in the *Ent. Record*.—ALFRED E. TONGE, Aincroft, Reigate. *April 7th*, 1905.

EXTENDED PUPAL PERIOD OF DIMORPHA VERSICOLORA.—Referring to my note (*Ent. Record*, xvi., p. 209), your readers may be interested to hear that one ♀ of the same batch of *D. versicolora* appeared in my breeding-cage on the 4th inst. (from 1899 larvæ). I may mention that they have been kept in a cool shed in my garden. I had three ♀ *D. versicolora* out last Wednesday, and went to the *versicolora* ground in hopes of a wild pairing, but not a gleam of sun and a very cold wind, so did not do any good, the cold nights, however, have stopped their emergence in the breeding-cage, so I hope to have a more successful try when the weather changes again.—W. E. BUTLER, F.E.S., Hayling House, Oxford Road, Reading. *April 9th*, 1905.

ENEMIES OF NONAGRIA ARUNDINIS (TYPHÆ) AND N. CANNÆ.—Referring to the notes by Mr. Ovenden and Mr. Bankes concerning the pupæ of *Nonagria arundinis* (*typhae*) being destroyed by water-rats, perhaps my experience in the Norfolk Broads will not be out of place. There, it is not the rats but moor-hens, but as *N. arundinis* (*typhae*) always pupates above the emergence-hole they seldom get the pupa of this species, it is nearly always *N. cannae* they get, as this species pupates below the hole and the moor-hens generally peck downwards.—H. M. EDELSTEN, F.E.S., Forty Hill, Enfield, Middlesex. *April 6th*, 1905.

EARLY APPEARANCE OF CHESIAS OBLIQUARIA.—Last night and to-night I have been very much surprised to find single specimens of *Chesias obliquaria* sitting in the usual manner upon broom, growing upon the railway banks near my house. Is not this a very early date for this species? I have never taken it here before, although I have searched carefully in June and July in the very same place where I have now found it. (REV.) C. R. N. BURROWS, The Vicarage, Mucking, Stanford-le-Hope. *April 18th*, 1905.

ORTHOPTERA.

PAIRING OF ARCYPTERA FUSCUM.—I sent Mr. Burr a couple of specimens of what I believe to be the same species of grasshopper as those I observed pairing at Au Pra (of which I seem to have kept no examples), taken at Bobbie, in the same beautiful Pellice Valley, and he informs me that the species in *Arcyptera fuscum*, Pallas. I think we shall be safe in assuming that the first part of the notice (*antea*, p. 95) therefore refers to this species.—J. W. TUTT.

VARIATION.

MELANIC LARENTIA MULTISTRIGARIA IN DURHAM.—I obtained a melanic male of *Larentia multistrigaria* here on the 30th ult., and on Wednesday captured a female with a black band upon its forewings. This species has appeared here in hundreds this year, although I never saw it in the district before, yet I have searched within a hundred yards of the place in which I have discovered it.—J. W. H. HARRISON, The Avenue, Birtley, R.S.O. *April 1st*, 1905.

COLEOPTERA.

GRAMMOPTERA RUFICORNIS AB. HOLOMELINA, N. AB., A WHOLLY BLACK FORM OF GRAMMOPTERA, SER., NOT HITHERTO RECORDED.—Entirely black, somewhat resembles *Grammoptera ruficornis*, F., of which species Mr. Gahan thinks it is a variety. It may be at once distinguished from the ordinary forms of *G. ruficornis* by the entire absence of the yellow silky pubescence with which the members of that species are clothed. The difference in the general appearance of the two insects, when seen side by side in the sunshine, is very striking. I propose for this very distinct and interesting form the name of *holomelina*, and, for the time being, it would, perhaps, be best to treat it as a form of *G. ruficornis*. It appears to have a stronger claim to specific rank than many of the insects appearing in our lists, but I must leave this question to be decided by further observation and study. My three specimens were beaten from hawthorn blossom in May, 1904, at Enfield, Middlesex. Mr. E. A. Waterhouse took a specimen, exactly like my three, at Ripon, in Yorkshire, thirty years ago. I should be glad to know of any similar specimens existing in other collections.—CHARLES J. C. POOL. *April 5th*, 1904.

HYLOTRUPES BAJULUS, L., AT ENFIELD.—I am indebted to a local friend for a fine specimen of this rare Longicorne beetle. It has been cased up with a number of common beetles, hornets, etc., for the past thirty years. A large pin was inserted between the elytra, which, fortunately, were open. The insect has now been relaxed and carded, and makes a perfect specimen. My friend cannot remember the exact circumstances of its capture, but he says the whole of his little collection was formed in and around a place known as Wilkinson's woods, near Enfield, about thirty years ago. The other insects in the case are all common and conspicuous species:—*Strangalia armata*, *Clytus arietis*, *Rhagium inquisitor*, *Lucanus cervus*, and *Cetonia aurata*, all of which are still common in the district. There is an abundance of old timber, which has already produced some very good beetles, and I see no reason why *Hylotrupes bajulus* should not be found there again if

looked for. In a very interesting series of notes on "The British Longicornes," published in the *Ent. Record*, 1898, Mr. Donisthorpe writes of this species as follows:—"*Hylotrupes bajulus*, L., is a large black, rather shiny, beetle, with a band of white pubescence on the elytra. It is very rare, and has not been taken for some time. It occurs in old posts and rails. Dr. Power took a specimen at Weybridge, and Mr. E. A. Waterhouse one at Putney. The last capture was made by Mr. Lewcock, at Cromer, about ten years ago." I do not know whether there are any more recent records than Mr. Lewcock's, which appears to be about sixteen or seventeen years old. I will keep a sharp look out for the insect during the present season.—CHAS. C. POOL, Enfield.

NOTES ON LIFE-HISTORIES, LARVÆ, &c.

EGGS OF LEPIDOPTERA. *Brenthis selene*.—Pale green in colour; of usual Argynnid shape, somewhat pyramidal, or rather in form of truncated cone; 20-22 raised, beaded, longitudinal ribs, running from base to shoulder, some failing before shoulder by joining with others, so that only eight or ten come over into the micropylar area at apex. The apical depression contains a very distinct central stella marking the micropyle proper. There is considerable variation in the size of the eggs, some being somewhat short and stumpy compared with others; in all, the base is flattened and the basal area slightly contracted, so that the greatest width is at about one-fourth of the perpendicular distance from the base (August 7th, 1901). During the next three days, the eggs become slightly yellowish in colour, and the shell more pearly (August 10th). Five days later, the eggs are grey in colour, the apex almost blackish; the larvæ hatched same day (August 15th). The newly-hatched larva, except in one instance, devoured the whole of the eggshell except the extreme base. The empty eggshell of this one is of a clear transparent pearly white. The larva does not appear to eat its way out of the egg at the micropyle, but at the side of the egg. Eggs laid by ♀ caught at Torre Pellice, on August 9th, 1901, and described only with a hand-lens. J. W. TUTT.

Stenia punctalis. Oval in outline, nearly as wide as long, much flattened, and with very large depression on the upper surface; very pale straw colour; surface somewhat shiny, slightly iridescent, apparently smooth. No further structure to be made out with power at disposal. Described August 13th, 1901, from four eggs laid by a ♀ captured at Bobbie, on August 12th.

Acidalia dimidiata. Oval in outline, width almost equal to length, height only about two-thirds width; the micropylar end rather wider than the nadir, slightly depressed on greater part of upper surface (belonging to that type of egg I have previously designated "slipper-shaped"), surface covered with a very strongly-marked and beautiful polygonal reticulation, which is regular and much less coarse than in some of the allied species; the upper surface with about nine longitudinal cells and fourteen transverse ones; colour pearly-grey when first laid, becoming creamy-grey as the egg matures. Laid loosely in a box, on August 13th, 1901, by a ♀ taken at Bobbie. By the 16th the egg itself is quite grey, the raised ribs forming the reticulation having a blackish appearance.

Charaeas graminis.—Laid loosely in a box; perfectly circular in outline, almost spherical; base apparently quite smooth, very faint trace of polygonal reticulation on rest of surface; a faint micropylar depression at apex of egg; surface dull, colour uniform bright yellow. [Eggs described August 14th, 1901, by a ♀ taken on August 13th, at Bobbie.]

Lithosia lurideola.—Of typical Arctiid appearance, circular in outline; height rather more than half the diameter, making rather less than two-thirds of a depressed sphere; micropylar area somewhat flattened, but most markedly depressed; surface covered with a fine and neat reticulation; pale orange-grey in colour when first laid, changing to deeper brown-grey by the next morning. The eggs are laid in regular rows, side by side, as is usual with the Arctiids. In one instance one egg is laid upon two others, these last being placed in different regular rows of four each in a small batch. Two days later the eggs were dark coffee-brown in colour all over, the reticulation clearer. [Described August 14th and 16th, 1901, from eggs laid by a ♀ taken at Bobbie on August 13th.]

Eubolia maeniata.—Laid loosely; pearly-white in colour; exceedingly small for size of moth; oval (almost spherical) in shape; surface shiny and apparently smooth (under power at disposal); one end depressed (August 15th, 1901). Bright orange-yellow; a very clear, shiny, circular space at one end of the egg, occupying, perhaps, one-third of the particular hemisphere in which it is placed (August 20th, 1901). [Eggs obtained from a ♀ captured at Bobbie, August 14th, 1901.]

Endotricha flammealis.—Oval in outline; the egg flattened; deeply depressed on upper surface; rather pointed at both sides; pale yellow when first laid, becoming pearly amber; surface wrinkled and smooth, shiny, and slightly iridescent. [Described August 17th, 1901, from eggs laid by a ♀ captured at Bobbie the preceding day.]—J. W. Tutt.

Two descriptions of the egg of Aspilates ochrearia.—(1) ·5mm. long, ·3mm. wide, laid on long side, would be almost regularly oval in outline, but the micropylar end is cut off sharply just before the tip, making this end quite flattened. The egg is of a dull orange-yellow colour, the shell is very faintly pitted, the latter showing under a good power as the traces of an obsolete longitudinal series of polygonal cells. There is also a tendency to iridescence in the shell. A considerable depression occupies almost the whole of the upper surface. Turned up on its true base the flat end of the egg is seen to contain a deeply depressed basin, at the base of which a minute pit represents the micropyle proper. The surface of the depression shows (but still more faintly than the outer shell) the remnants of a polygonal reticulation. [Described under a $\frac{2}{3}$ lens, June 22nd, 1898. Eggs laid June 17th, 1898, by a ♀ captured at Shoebury, and sent by Mr. F. G. Whittle.] (2) Pale straw-yellow, long oval in outline, with ends so squared as to be almost brick-shaped, the micropylar end somewhat fuller than the nadir, the upper surface with a long oval depression, reaching nearer to the nadir than the micropylar end. The surface covered with fine longitudinal and transverse lines, giving it the appearance of the fibres of fine silken material, the longitudinal being slightly raised. The micropylar end has a well-marked depression on micropylar area. The length : breadth : height : : 5 : 3 : 2. The egg is normally laid on its flat side, but is sometimes turned up partly on edge, at others is

placed upright, with the micropyle at apex. The egg in about four days turns deep yellow, inclining to a brownish tint. [Laid April 7th, 1897. Described on the 11th, from eggs obtained at Cannes.]—J. W. TUTT.

TWO INDEPENDENT DESCRIPTIONS OF EGGS OF CHESIAS RUFATA (OBLIQUARIA).—The eggs are laid on the leaflets and flower-buds of *Genista*, sp. ? singly, on their flat surfaces. The egg forms an almost perfect oval in outline. Length : breadth : thickness : : 3 : 2 : 1, but slightly thicker at the micropylar end than at its nadir. The colour is of a delicate orange, approaching salmon colour. There is a large and rather deep depression in the centre of the upper surface. The micropyle is placed at the centre of one end, a small area being flattened, and slightly depressed centrally. The shell is very faintly pitted, the edges of the pits giving the surface a whitish and hoary appearance. [Described under a ⅔-lens, on July 7th, 1898, from eggs laid May 25th-27th, by a ♀ taken at Wanstead; received from Mr. Bacot.] Two eggs laid loosely in a box by a captured ♀ ; the eggs themselves, however, adherent to each other. Very pale yellow in colour; and very small for the size of the moth. May be said to be of ordinary Geometrid form, oval, with a slight depression on upper surface, but bears a distinct resemblance to an upright Acidaliid (or even a Pierid) egg. The shell is apparently smooth, and under a low power (⅔-lens, used as an eye-glass) no markings whatever are decipherable, but under a more powerful lens a faint polygonal network is observable. The long axis : width : height : : 7 : 3 : 2. [The eggs were laid on April 17th, 1898, by ♀ taken at Cannes, and described the same day.] N.B.—My two sketches of these eggs suggest considerable differences, so much so that one suspects a difference of species. At any rate the descriptions should be checked.—J. W. TUTT.

NEWLY-FORMED PUPA OF SCOLIOPTERYX LIBATRIX.—On August 16th, 1901, I was fortunate enough to see a pupa of this species that had just changed from the larval stage. All the appendages—legs, wings, antennæ, eyes, as well as the head and thoracic segments—were quite bright pea-green. The pro- and metathorax quickly changed to a brownish tint, the mesothorax also changing to the same tint dorsally. The 1st to 7th abdominal segments were greenish-brown, the terminal segments blackish. [This was from a larva taken, with several others, near Villar, in the early part of the month.]—J. W. TUTT.

NOTES ON PYGÆRA PIGRA.—Owing to lack of careful observation of the earliest stages of this moth, some rather grievous errors crept into my former notes published in the *Ent. Record*, vol. xvi., p. 208. Even these additional remarks on the subject are not fully satisfactory, although rectifying several mistakes, and a careful study of all the stages will be necessary in the spring to clear up the matter finally. My inability to secure perfectly satisfactory results from the second brood was due largely to the abnormal length of the pupal period. In central Germany, *P. pigra* is normally double-brooded, the second brood appearing in July and early August. As my first brood had all pupated before the middle of June, I naturally looked for emergences in July. However, with the exception of one or two isolated specimens in the beginning of the month, nothing put in an appearance, and that in spite of the intense heat. As by the middle of August the pupæ gave no sign of producing the imagines, I concluded that the brood would pass the winter in this condition, and

[illegible] surprised to find two ♂s newly emerged on August 18th. [illegible] 26th two more put in an appearance, followed irregularly by [illegible] intervals of a day or two. Not until September 5th, how- [illegible] I secure a pairing, eggs being freely laid during the nights [illegible] 7th. Egg. When first laid the eggs are of a muddy flesh [illegible] at the base, and well rounded towards the micropylar end, as [illegible] of this family. By the 10th they had turned dark [illegible] brown, becoming gradually, as the larva developed, almost [illegible] Larvæ emerged on September 21st and 22nd. LARVA. [illegible] The young larva has a black head and yellowish grey [illegible] coarsely covered with whitish hairs. The 4th, 6th, 7th, 10th, [illegible] 11th segments are chocolate brown. In the advanced stage there [illegible] to the formation of a yellow band dorsally, com- [illegible] spreading of the chocolate colour laterally. The 1st [illegible] on September 29th and 30th. *Second instar.* The [illegible] was now chocolate brown, with broad, irregular, yellow [illegible] clouded in the middle segments with brown, and [illegible] a thin brown lateral stripe, bordered by a row of brown [illegible] tubercle 1. Slight traces of yellow marking later [illegible] anterior segments. 2nd moult, October 8th-10th. *Third* [illegible] No marked change in colouring or marking. Dorsal band [illegible] extending laterally to tubercle [illegible], which is in [illegible] yellow. The lateral tubercles also more pronounced [illegible] moult, October 27th-30th. This moult corresponds [illegible] stage in my previous notes attributed to 2nd moult. [illegible] more rapid development in the [illegible] two [illegible] have followed each other [illegible] overlooked. At this [illegible] of the food plant [illegible] to prevent their [illegible] It was certain, however [illegible] [illegible] 1905.

CURRENT NOTES.

[illegible]

the gland. Has anyone made any observations on our common south European species?

Mr. Hancock is rapidly augmenting our knowledge of the *Tettigidae*. His contribution alone, to the literature of this group, is already considerable. His latest work is on the "*Tettigidae* of Ceylon," published in *Spolia Zeylanica*, vol. ii., part vii., October, 1904, at Colombo. It is well illustrated with four good and clear plates. The author includes 27 species, which should not offer very great difficulties, as clear tables are given to enable collectors to discriminate their species. The material is chiefly that obtained by Mr. E. E. Green, who came across nearly all of these 27 species; nine of them are new, and there are six new genera. The work is preceded by an introduction dealing with the characters of the island, and considerations of a faunistic, structural and systematic interest. The aquatic habits of *Scelimena* are confirmed by the observations of Mr. Green, and notes on other species are appended.

At the meeting of the Entomological Society of London, held on March 15th, 1904, Mr. W. E. Sharp exhibited a specimen of the North American Longicorn, *Neoclytus erythrocephalus*. He said the species had been discovered in a sound ash-tree seven inches from the bark, grown in the neighbourhood of St. Helens, Lancashire. Some palings of American ash in the vicinity suggested the origin of the progenitors of the colony; but it was not known how long they had been erected.

Mr. Bagnall adds (*Ent. Mo. Mag.*) *Triplax bicolor*, Gyll., to the British list; the specimens were taken in Gibside in July, 1904, with *T. aenea* (see *Ent. Rec.*, 1904, p. 260) in fungus growing on elm. Mr. W. E. Sharp also adds *Amara anthobia*, Vill., to the British list, from specimens taken by the Rev. G. A. Crawshay at roots of grass in sandy places, at Leighton Buzzard.

Mr. Champion notes that since publishing his note on the capture of *Malachius spinosus*, Gr., in Sheppey, he has discovered (from types sent by Bedel) the insect to be *M. rubricatus*, Ab., and that Mr. Walker also has the species in his collection, specimens having been captured at Sheerness about 1894.

INFORMATION ON BUTTERFLIES REQUIRED.

I should be glad to have any of the following material for description if available, or notes on habits when these are desiderated:—*Pamphila sylvanus*: Pupa. *Thymelicus thaumas*: Egg, egg-laying. *T. actaeon*: Egg, egg-laying. *T. lineola*: Pupa. *Nisoniades tages*: Egg, egg-laying, pupa. *Chrysophanus phlaeas*: Egg, egg laying. *C. dispar* (European form): Egg, larva, pupa. *Callophrys rubi*: Larva (early stages). *Thecla w album*: Larva (all instars), puparium, pupa. *Thecla pruni*: Egg, egg-laying. *Polyommatus corydon*: Larva (all stages). *Lampides boeticus*: Egg, egg-laying. *Nomiades semiargus*: Egg. *Nemeobius lucina*: Pupa, pupation. *Melitaea athalia*: Egg-laying. *M. cinxia*: Egg laying, egg, habits of larva. *Argyn paphia*: Egg-laying. *Vanessa io*: Egg-laying, egg, young larva. *Pyrameis cardui*: Young larva. *Pararge megaera*: Larva (young and old). *Coenonympha tiphon*: Larva (all stages). *Melampias epiphron*: Larva (fullfed). Any accurate details, published or otherwise, on the above points, will be most gratefully acknowledged.—J. W. Tutt.

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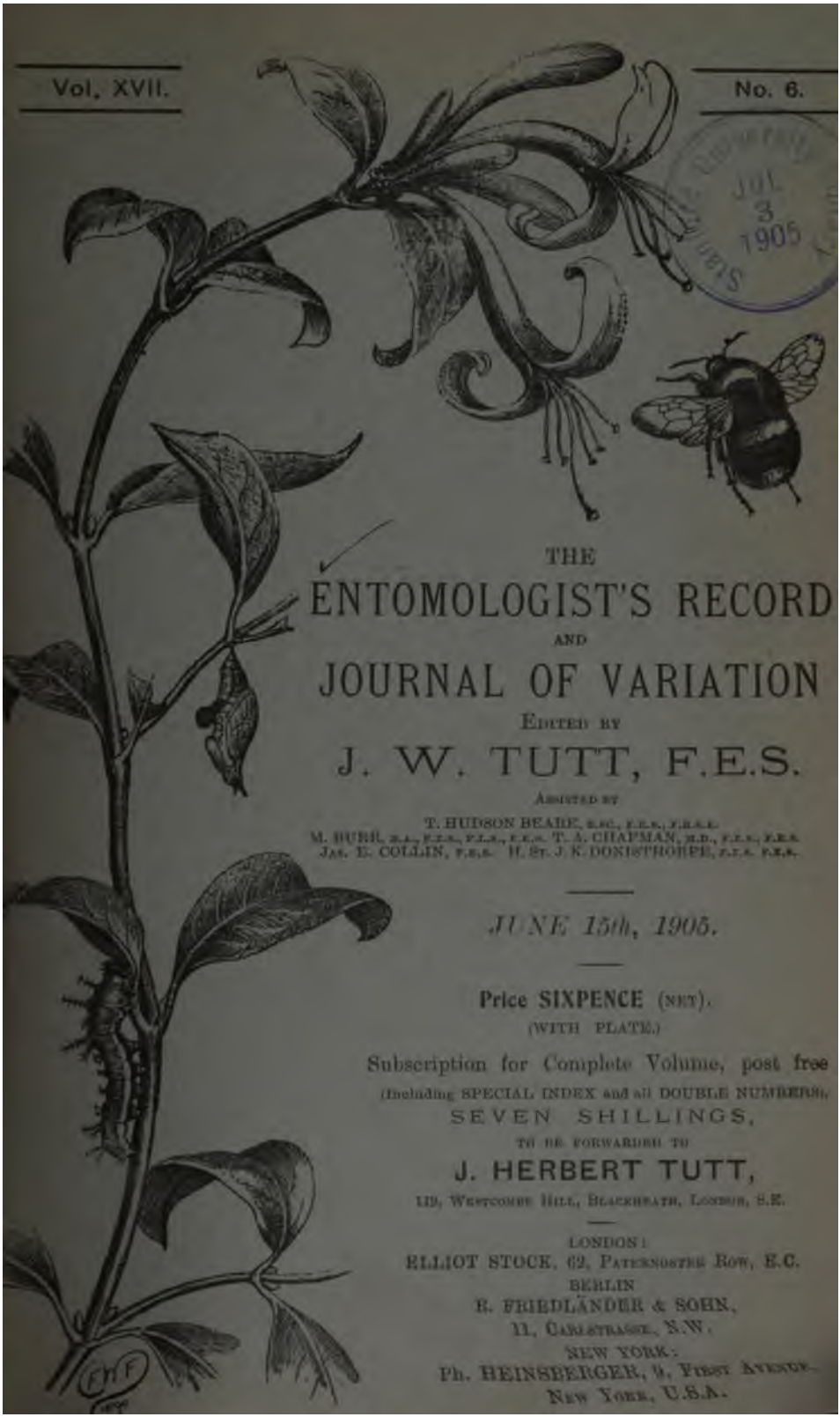

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Notes on the genus Cerura (Dicranura).

(Rev.) A. MILES MOSS, M.A.

Having spent a considerable amount of time during March in searching for the cocoons of the three "kittens," I have thought that the following notes may perhaps be of interest to others. My efforts have resulted in the finding of a large number of empty cocoons and some full ones, and, by dint of perseverance, I have, for the first time in my life, had all four British Dicranurid species represented at the same time by living pupæ. Let me at once assert that nothing short of the spirit of the raving enthusiast will accomplish this feat! But if the work was laborious it has been none the less of absorbing interest.

My first conclusion is that this is undoubtedly the wrong time of year to secure the best results, and I am led to believe that such is especially the case in any part of the country where insectivorous birds are numerous. Let me tabulate my observations under the headings of the four species:—

Cerura vinula.—The species is, of course, common throughout Norfolk, but comparatively few cocoons have been found, as the larvæ very frequently leave the tree. The cocoons were generally near the ground, but occasionally six or eight feet up the trunk, and on all sides of the tree. They are fairly easy to detect as they usually protrude above the general level of the surrounding bark. Several fresh cocoons had been pecked open by birds and the contents cleared. This is also largely the case with *Trochilium apiformis* at the roots of poplar, the bark presumably being tapped in likely places until the thin drumlike cover gives forth a hollow sound and betokens the presence of a cocoon within. I only obtained one full cocoon of *C. vinula*, from which a large female has already emerged after barely three weeks of moderate forcing in a kitchen cupboard.

Cerura furcula.—Of this species I have some fourteen full cocoons, but these were all obtained in the larval condition last autumn, some in the Lake District near Windermere, and some in the Norfolk Broads. *C. furcula* seems equally common in both districts, and, while a few specimens fell in the beating-tray, I obtained the majority of larvæ by searching small sallow-bushes. In such cases, where the stems are smooth and thin, they, as a rule, undoubtedly leave the bush before pupation. Their characteristic method of entirely stripping the end of a small bough, and the nature of the frass, frequently testify to their recent presence, but I can only recall two instances of the discovery of their cocoons in such unprotected positions, and these were probably cases of necessity, the bush having stood in water and thus prevented their escape. I have recently found a considerable number of *C. furcula* cocoons on willow trunks near Norwich. A few of these have been freshly emptied by birds, but the majority were old. The most favoured spot for pupation, where, indeed, they are most protected and easiest to see, is underneath pieces of bark that have lifted and can be broken off with a trowel. *C. furcula* seems to affect any species of willow without much preference, and the cocoon occurs on every side of the tree, and in almost any position, provided that it be dry.

Cerura bifida.—This species, somewhat rare in the north, seems common in the eastern counties, judging from the large number of

empty cocoons of different dates that have come under my inspection. One seldom approaches an aspen or Lombardy poplar, still less a group of such trees, without finding empty cocoons. Here, too, the wandering propensity is observable, one cocoon being noticed on the bark of an oak ten yards distant. More often, however, one would suppose that the innumerable crevices of an old poplar trunk offer sufficient inducement for it to remain, and I am bound to say that it manages only too successfully to evade the most diligent search. My net result is but three living pupæ, though I have carefully scrutinised hundreds of trees, and two of these were spun up on the underside of bark near the root, prized off with a trowel. Such a position, no matter on what point of the compass, is the one most often selected by the larva if it be available. I have noticed, however, that the prolonged humidity of winter often kills them in this situation. The cocoons also occur on any part of the tree, generally within six or eight feet from the ground, and I believe that I am not exaggerating when I say that I have recently discovered scores of fresh ones that have been ripped open from end to end by birds, the cast-off larval skins still lying at the bottom. I conclude that this is mainly the work of tits, as one cocoon, under loose bark at the root of an aspen, which had been thus treated, could only have been reached by a small bird. With this wholesale plunder the species is undoubtedly decimated and kept down to a very large extent, and one wonders how many actually survive. Though birds' eyes may be sharper than mine, I am proud enough to believe that a fair proportion of these would have fallen to my lot had I forestalled the feathered foe by searching in October rather than March. *Moral:* Don't put off till the spring what can be done in the autumn.

Cerura bicuspis.—The climax of one's interest has of course been reached in the successful quest for this species. In the Norfolk list it is recorded for Merton, Sparham, and Aylsham, and a larva was taken at Cromer in 1902 (*vide Ent. Record*, vol. xv., 53), but I was able to satisfy myself that the species occurred closer to Norwich by finding, in the autumn of 1901, three old cocoons on birch-trunks at Stratton Strawless, some seven miles from the city. I had failed, however, to follow up this clue until the present spring, when, with a return of the season's ardour, I determined to prosecute a vigorous and thorough search. I began by reading up every scrap of information respecting the species from books old and new, and from the monthly periodicals for the past sixteen years, and I should like here to express my thanks both to Mr. Tutt for his "Practical Hints," and also to Dr. Chapman for his valuable article on the species in Herefordshire (*vide Ent. Record*, vol. xii., p. 73). In fact, it is the strong corroborative evidence that I can bear to his experiences in my own, and the practical value that I attach to the placing on record of simple facts and observations, that has induced me to write this article as a supplement to his. I rode over to Stratton on March 13th, and was remarkably fortunate in at once discovering a new locality, taking in three sub-districts as many as sixteen cocoons in the space of five hours. They were all on larch, and about half a dozen were merely fragments of ancient date. It would be difficult to say how old they were, but certainly they had weathered more than two years. Several of the remainder, by the comparative freshness of their lining and pupa shells, I estimated as

[illegible] specimens. One, however, formed about a foot from the [illegible] facing east, was perfectly fresh, but alas! its contents had [illegible]. It was a beautifully made cocoon, of a greenish-white [illegible] harmonising with the piece of birch bark to which it [illegible]. It had already been detected by a tit or woodpecker, and [illegible] torn open from end to end. This must have occurred but [illegible] previously, as the characteristic larval skin, with its two [illegible] exposed on the bark, and would certainly have been [illegible] away with the first gust. This was extremely annoying, but, of [illegible] one with hope and determination to succeed. I found [illegible], however, though I minutely examined that tree up and down, [illegible] and rough, and all the birches and stumps around for [illegible]. So far the only addition to my collection was a varied sample [illegible] cocoons, which I always make a point of preserving. I [illegible] make a few general remarks as to their position. They [illegible] trees of considerable growth, on dry soil, and with [illegible] surroundings, and I took special note of the fact that [illegible] on all sides of the tree, with a possible preference [illegible] of leaning trees for that side where they would be [illegible] from the rain. The majority of trees possessed low [illegible] the larvae had probably fed, and could [illegible] have [illegible]. But this was not always the case, the [illegible] some trees being ten or a dozen feet above [illegible] and [illegible] quite out of the ordinary range of inspection. Some [illegible] the [illegible] bark, where [illegible] to see, but quite [illegible] many, I think, [illegible] the [illegible] especially where the silver [illegible] with grey [illegible] [illegible] [illegible] than that of [illegible] [illegible].

[illegible] on March 27th [illegible] the [illegible] of [illegible] [illegible] Hereford, [illegible]

branches to get to the trunk, but my efforts were once more crowned with unlooked for success, for, on breaking off a piece of loose bark with my hand, I found, spun up on the underside, another full cocoon, the only case in which I have observed this species in such a position. This was of a warm brownish hue, not so large as the former, and tougher and more glutinous than those of *C. bifida* when spun under bark. It was situated about four feet from the ground facing west.

This ends my experience with *C. bicuspis* to the present date. It only remains in conclusion to observe that the species seems to be of fastidious temperament and restricted in its range, occurring in small numbers year after year in the same place. I have thoroughly worked many other groups of birch trees in the immediate neighbourhood, growing in positions apparently the most favourable, but without seeing the least trace of an old cocoon.

The two full cocoons of *D. bicuspis* produced perfect ♀ imagines on April 22nd and May 9th respectively.

Lepidoptera near Geneva.

By J. W. TUTT, F.E.S.

(*Concluded from* p. 132.)

The next day, July 28th, was to be a great day, a journey up the Grand Salève, a collecting-ground made historical by the work of Professor C. Blachier some 20 years ago. Like all other grounds overrun by tourists one wants to know where to go for the insects that haunt such spots, for, in truth, most of the species are as localised here as in England. This beautiful limestone hill of about 4300ft. elevation, was reached by tram to Veyrier, and thence by electric car to Monnetier (2340ft.), whence we walked to the summit and came down by the Grande Gorge. On the whole I was greatly disappointed with the day's work entomologically, my fault, no doubt, entirely, as I could not cover the ground desired by my companion. A specimen of *Hipparchia briseis*, almost before we left Monnetier, presaged success, as also did the abundance of *Polyommatus corydon*, *P. icarus*, *P. damon*, *Melanargia galatea* (worn though), clouds of *Epinephele tanira*, *Dryas paphia*, *Argynnis aglaia*, and odd specimens of *Thecla ilicis*, *T. spini*, and other species, and an abundance of *Anthrocera carniolica*, *A. achilleae*, *A. transalpina*, and *A. filipendulae*, but the hope of a really good bag remained unfulfilled. The same species remained abundant in suitable places all the way up the ascent, single specimens of *Chrysophanus dorilis*, *Adscita geryon*, *Polyommatus baton* and others were added to the bag, whilst *Leucophasia sinapis* and *Colias hyale* occasionally got in the net; in one place, countless *P. damon* swarmed in both sexes, the ♂s altogether too poor for cabinet, but by the time the Treize Arbres station was reached nothing of real importance had been captured. Just beyond, however, *Hipparchia semele* was abundant, and I picked up two or three *Parnassius apollo*, and a few fine big specimens of *Spirlothus alveus* (of which I am getting together a magnificent series from various localities I have visited) and then I moved over towards the edge of the mountain near the top of the Grande Gorge. At last we had left the tourist behind and struck, for a moment, the uninjured wild nature. *Pamphila comma* began to appear, and *Thymeli-*

cus lineola, and then, among other burnets, I saw the flight of an insect I thought I recognised at once as *Anthrocera fausta*, which I had found at Barcelonette, in August, 1900. It had here a similar habitat among the bushes, flew in the same restless manner, and was as different as possible from the lethargic *A. carniolica*, and I knew at once that I had got on the track of Blachier's species, *A. genevensis*, or more correctly, *A. jucunda*. I worked away now on the slopes, and picked up first one and then another, until I had pinned 8 or 10 moderate specimens and rejected a score of worn ones. My active companion, who had, I doubt not, found my slow movements a great bore, reappeared after a considerable journey to another part of the summit, laden with spoils, and wanted little persuasion to descend the slippery slopes, where he captured a few more examples. I knew, however, this could not be its home, that the warm slopes at the base would shelter this southern insect, and so I found it was, and very disgusted was I to learn afterwards from Professor Blachier that he had seen a dozen collectors, at one time, hunting the species a week or so before on his own ground, the insects going, no doubt, to the German dealers for sale. The descent of the Grande Gorge was quite interesting, a nice series of *Satyrus alcyone* (*hermione* of many of the natives), an occasional giant *Gnophos furvata*, *Erebia stygne* at the top, swarms of *Erebia aethiops* all the way down, and an abundance of *Enodia dryas* at the foot. But the sun was going off the ground, and *Melitaea cinxia*, *M. dia*, and *M. parthenie*, picked off the plants with the fingers, awakened new hopes, for I had made up my mind that if *M. parthenie* was to be got, I would have a series that would bear comparison with any in Europe. So we hurried off to the tram in order to be in Geneva at least in time for dinner, and I felt I owed a deep debt of gratitude to Mr. Muschamp for having introduced me to as interesting a locality as any round Geneva.

The insects captured the last day or two were accumulating, and setting commenced soon after daybreak on July 29th, whilst I had already made a fixed resolution to finish. But by 10 a.m. the hot sun in a cloudless sky evaporated the resolution, and I started off, on my own account, to the foot of the Grand Salève. I did not intend to ascend the mountain, but just to lounge at the foot among the tangle of wild thyme and marjoram, on the skirts of the wood that creeps far up the lower slopes. And what a day it was. Along the road, beyond Veyrier, *Colias hyale* abounded in all the fields with *C. edusa*; *Leptidia sinapis*, and *Epinephele tithonus* swarmed with *Pararge megaera* and *E. janira* by the hedgesides; *Gonepteryx rhamni* flew lazily or sucked the nectar indolently, whilst occasionally the large fritillaries flew across the road, evidently out of their regular habitat. Turning into the lane made known to me by Mr. Muschamp, at least a dozen *Callimorpha hera* were seen at once flying wildly about, *Pararge egeria* of Central European form was common but worn. But it was to the flower-banks I was bound, and when I reached there I was not disappointed. *Melitaea didyma* was the first species that I worked for, and a lovely series of brightly-tinted, but small, specimens, resulted, the ♀ s of the same light hue as those from Aix-les-Bains and other Savoy localities, but altogether wanting in the size of the brilliant specimens from the South—Tragacete, Cuenca, &c. *Melitaea parthenie* was not very common, not more than a score of specimens seen, whilst *M. cinxia* and *Brenthis dia* each only produced about a half of this number. Of the larger

fritillaries, *Dryas paphia* was very abundant, but getting distinctly *passé*, whilst *Argynnis aglaia* and *A. adippe* were in good condition, but comparatively scarce. Leaving out *Epinephele janira*, which everywhere swarmed, the commonest butterflies of the slopes were *Gonepteryx rhamni* and *Enodia dryas*. It was difficult to take a step anywhere without putting up these species, and both were in excellent condition. Here, too, *Hipparchia semele* and *H. alcyone* had abandoned their usual habits and fed greedily on the flowers, thus allowing an easy capture. This habit of coming to the flowers was found common at St. Michel-de-Maurienne in August, 1897, in both these species, where they abounded on the sainfoin and lucerne. Near the edge of the woods, *Erebia aethiops* began to be abundant, and, in the open glades, they were in countless numbers, some magnificent ♀ s falling to the net. On the large umbellifer flowers two *Zephyrus betulae* ♂ s were discovered, and a single *Thecla spini*. Evidently *Coenonympha arcania* and *Thymelicus actaeon* had both been common here, as testified by many worn examples. Owing to the abundance of the species wanted, the common blues and burnets of the district were practically passed as unworthy of note, and I have no record of what I really saw, but I could not resist the temptation of boxing a few lovely second-brood examples of *Euthemonia russula*, which insisted on finding their way into the net. The absence of the commonest Chrysophanids, and the apparently comparative rarity of Lycænids, except *P. icarus* and *P. corydon*, however, struck me as being quite unexpected and inexplicable.

One other visit was paid to the foot of the Grand Salève, *viz.*, on August 1st, this time with Mr. Muschamp. The day was again delightful, and insects seemed almost as abundant as on the 29th, and some, perhaps, were so, *Colias hyale* being now very numerous. *Pieris daplidice*, not noticed before in this direction, was pretty abundant in all the fields just beyond Veyrier, some quite fresh, others worn, as if they had been on the wing some time, without coming our way, whilst *Issoria lathonia* also made a first appearance. A tiny example of *Limenitis camilla* (ab. *minor*), with a total expanse of 42mm., struck me as being very small, but it was evidently the result of a larva badly placed that had had a hard struggle to get through, as a single, very worn, normal sized specimen was also noticed. On the slopes *Melitaea didyma*, *Brenthis dia*, *Thymelicus actaeon*, and *Zephyrus betulae* were frequent, whilst *Erebia aethiops*, *Enodia dryas*, *Hipparchia alcyone*, *H. semele*, *Gonepteryx rhamni*, &c., were abundant as ever, and single examples of *Pamphila comma*, *Syrichthus sao*, *Polyommatus hylas* and *P. bellargus*, and a ♂ and ♀ *Nomiades semiargus* were for the first time observed (yet the ♀ of the latter species was worn). In some meadows at the side of the slopes *Melitaea parthenie* was found more abundantly and a few more nice specimens were taken. The only Anthrocerid observed was *A. filipendulae*, and just in the woods, a single *A. jucunda* (*genevensis*) was netted. Mr. Muschamp got a specimen or two of *Lampides boetica*, a species that I did not see, otherwise our bag was very similar. The environs of Geneva, indeed, present a most delightful variety of collecting grounds, and one only hopes that the rampant professionalism among the entomologists of almost all continental towns will not exterminate the very local species, which even here, close to the city, are none too abundant, and, owing to their localised habits could, without much trouble, be easily exterminated.

Sculpturing of the pupa of Thestor ballus (*with plate*).

By T. A. CHAPMAN, M.D.

In my notes on *Thestor ballus* in the *Ent. Record*, xvi., pp. 282 *et seq.*, I referred to the elaborate sculpturing of the pupal skin. I am indebted to Mr. F. N. Clark for photographs of portions of this structure, and though the reproductions of these here given do not do justice to the delicate tracery they represent, they will enable some idea of it to be realised. Plate v., fig. 2, is a representation of the greater part of the dorsal area of the first four abdominal segments, magnified 20 diameters. The surface has scattered over it a number of small knobs, which are specially crowded round the spiracles, the little knobs are connected together by raised causeways, lower than the knobs, but raised above the general surface. From each knob there may radiate one or two, up to five or six, or very rarely even eight, of these causeways, forming a very elaborate pattern on the surface.

On Plate v., fig. 1, is a portion of the same surface magnified 100 diameters, in which these causeways may be better seen as well as the structure of the knobs. I say the structure may be seen, but that it can be quite understood, even by a careful examination of the actual specimens, is more than I am prepared to say, as I do not think I quite understand it. What one sees, however, is the raised dark knob, extending outwards in usually six directions into the causeways, actual or abortive, whilst centrally there is a darker circle enclosing a white star, usually with five rays and a dark central spot.

There can be little doubt each knob represents a secondary skin hair, but of what the actual structure is, I can say nothing beyond a guess that the white star is really a very abbreviated hair, with a stellate top. This conclusion is suggested by a comparison with equally curious structures on other pupæ.

Notes on Hyles euphorbiae, L.

By J. W. H. HARRISON, B.Sc.

In January (1905) I received some pupæ of *Hyles euphorbiae* from my friend, Mr. Verity of Florence. As these pupæ have now produced their imagines, and the ova resulting from an attempt to breed the species have proved infertile, some notes on the speeies may be interesting. Mr. Verity, in a list (which appears in the *Bulletino della Societa Entomologica Italiana*, pp. 123-170) of lepidoptera taken upon the coast of Lucchesi, Italy, makes some very interesting remarks upon this insect. He has spent two Septembers in Forte dei Marmi, and each time has obtained the larvæ of this species in plenty, but makes the noteworthy remark that, whereas the larvæ obtained in 1904 were quite normal, those he collected in 1902 were far from being so. In point of fact, so far did they vary from the type, that he was induced to suppose that there was a probability that they were the progeny of *H. nicaea* and *H. euphorbiae*, and that the constitutional weakness observed in the larvæ in 1902 partially confirmed that suspicion. In conclusion, he makes the statement "infatti costituiscono ostensibilmente un passaggio alla larva della *D. nicaea* che abita la Riviera di Levante." Although the larvæ in 1904 were typical, one of the pupæ, which he was so good as to send me, had the wing-cases and the cases of the antennæ and legs jet black.

From his pupæ in 1903 he obtained a specimen of ab. *paralias*, Nick. I suppose the pupæ resulting from the larvæ collected in 1904, which he retained himself, will not yet have emerged. I may say, however, that I obtained also a specimen which answers in every detail with his description of the above aberration. [A literal translation of Nickerl's own description is published in *The Nat. History of Brit. Lepidoptera*, iv., pp. 207-208.—Ed.] Not wishing to lose the pupæ, I have forced mine in a gentle heat, and have been successful with all the pupæ. Some emerged during the last week in March, and others, subjected to exactly the same treatment, in the third week in April. Now, Mr. Verity in his notes discusses the occurrence of almost fullgrown larvæ with some about three centimètres in length. I think this will be due to the period of emergence extending in nature over several weeks, and hence the period of ovipositing over the same time.* The pupæ commence to soften on the third day before the exit of the imago. This exit takes place, according to my observation, between 6 p.m. and 8 p.m.

As nearly all the imagines produced were females, I killed and dissected two immediately they dried their wings. Inside the abdomen I found that, with the exception of a very few, the ova were only rudimentary. The question then arose in my mind whether this was due to my having forced the pupæ, or whether even in nature (as Mr. Johnson, of Gateshead, informed me) this was the case. To test this I isolated one of the imagines and kept it alive in a cage. I kept it alive for three weeks, and, at the end of that period, I found it dead one morning. During the night of its death it had deposited about 20 ova. On dissecting it, I found that all the ova were fully developed. Hence I conclude that the females live for some time before their ova are developed. The ova were deposited singly, and, contrary to the position of the ova of *Smerinthus ocellata* and *Sphinx ligustri*, are laid with the long axis upright.† In colour the ova are of bright apple-green. In shape they are approximately spherical, but are not quite so, and even the two horizontal diameters are not the same. The height is 1·3mm., the breadth 1·2mm., and the breadth in a direction at right angles to this 1·1mm. At first, under a low power, I was inclined to think that the ovum was smooth and glossy, and even under a high power, all that was added was a series of irregular undulations giving the idea of a degenerate net-like sculpture. In what would have been the meshes of the network, had the network been more distinct, were rounded prominences, which showed by the play of light on them that they are raised above the level of the shell very slightly. However, in another specimen which was favourably placed for the examination of the micropyle, I chanced to find a true network, resembling cells, with the ribs firm and distinct. The meshes consisted of quadrilaterals and polygons with an indefinite number of sides. Near the point at which these meshes degenerate they are fairly regular, with the length equal to the breadth. Closer to the micropyle they become very elongated, and closer still, they become small and irregular. The micropyle is situated at the apex of the

* This is usual wherever the species occurs. We saw some dozens in the Saas-Thal last summer of all sizes, but this difference in size means little in point of time, as the larvæ feed up very rapidly in the last two stadia.—Ed.

† Compare *Nat. History of the British Lepidoptera*, iv., pp. 212-213.—Ed.

ovum, *i.e.*, at the point furthest away from the point of attachment*. Around the micropyle is a series of thirteen or fourteen cells resembling the petals of a flower. The micropyle itself is a depression with punctuations. These petal-like cells appear darker green than the rest of the cells, due to their being slightly raised and thus having a dark side upon the side opposite to the source of light. The micropyle, with these cells, curiously resembles a sunflower, of which the micropyle with its depressions are the tubular flowers, and the petal-like cells the ligulate ones. The mesh structure extends three times the breadth of the sunflower-form down the side of the egg and thence, as stated above, degenerates.

In conclusion, I made a curious observation upon the imago. If irritated or alarmed, it opens its wings almost to their full extent and raises them at an angle of about fifteen degrees to the horizontal plane. It then curves its body, or rather its abdomen, almost at right angles to the thorax, and gives a series of audible taps upon the base of whatever it is confined in.

When indulging in this habit the general appearance reminded me strongly of that of a *Bombus*, which has been intoxicated, on a flower. As these observations were made upon females, I thought perhaps the motions were in some manner connected with sexual impulses.

Notes on Collecting in Egypt, 1903 and 1904.

By PHILIP P. GRAVES.

I passed the year 1903 at Cairo, with the exception of a couple of months at Aboukir on the north coast of the Delta, and was able to make numerous outings, which, however, brought in, as a rule, very small bags. The poverty of the country in lepidoptera was very marked. Close cultivation, irrigation, and the utterly desert nature of unirrigated tracts, combine with the great physical uniformity of Egypt, to make the number of species that a collector can hope to take very small. In January and February, 1903, the weather was cold and windy. Worn *Danais chrysippus*, *Pyrameis cardui* and *Lampides boeticus* were the only common species; *Anthocharis belemia* occurred in cultivated land in small numbers, and was fond of bean-flowers, on which it rested with wings half spread and drooping, being then very difficult to distinguish. *Pieris rapae* occurred, and I took a fine ♀ *Anthocharis belia* at Wadi Hof, in the Arabian Desert, behind Helonan. In March and April matters improved greatly. I collected vigorously at Ezbet el Nakhle and Marg, some ten miles northeast of Cairo, in spots where the cultivation was less intense than usual. I first took *Polyommatus lysimon* on March 8th, several specimens having the underside of the hindwings unspotted, *Colias edusa* and ab. ♀ *helice* appeared early in the month in large numbers, and *Pieris rapae*, much powdered with black on the underside of the hindwings, was also abundant.

* This is so unusual in a Sphingid that the observation wants confirming in as many cases as possible to show that it was not accidental in this instance. No hint of such a remarkable circumstance is given in the descriptions by Bacot and Weismann (see *Nat. History of the British Lepidoptera*, iv., p. 213), and we have never examined an example that has not had the micropyle placed at one end in true Sphingid fashion. We suspect Mr. Harrison has described the slight depression occurring usually on the upper surface of the egg of this species as the micropyle.—Ed.

Anthocharis belemia g.a. *glauce* was well out by the middle of the month and lasted to the second week of April. Three species of *Lampides*—*L. boeticus*, *L. theophrastus*, and *L. telicanus* occurred, the first two commonly. All three have a jerky flight, going off wildly when disturbed, and are very fond of the flowers of the cultivated vetches, so common in Egypt. *L. theophrastus* is, unfortunately for itself, fatally conspicuous when "roosting" on grass stems, and all my best specimens were taken that way. Of the Hesperiids I took *Parnara mathias*, which also occurs at the Cairo Barrage and the Ghizeh Zoological Gardens, and which, when disturbed or missed by the net, goes off more rapidly than any Hesperiid I know. *Parnara nostradamus* occurred in the same localities, though less frequently in the spring. *Pyrameis atalanta* was occasionally to be seen in gardens at Cairo, and *Danais chrysippus* appeared at the end of April in large numbers. This butterfly undoubtedly occurs with *Pieris rapae*, *Pyrameis cardui*, and *Lampides boeticus*, throughout the year in Egypt, and, indeed, it is difficult to say that there is much interval between the broods of many Egyptian butterflies. I give a few examples—*Polyommatus lysimon*, March-April (Cairo), April-September (Alexandria), August-December (Cairo). *Hypolycaena livia*, April-July, and in September, Alexandria district; August (worn), September (fresh) and on to November 9th, 1903, at Cairo. *Parnara mathias*, from April-November, at Cairo, from May-August, if not later, at Alexandria.

I was able, in the spring of 1903, to get a few days' collecting in the desert, east of the Nile, behind Helonan. The collecting ground looked most unpromising. Imagine a winding rocky trout stream, with steep banks, often rising to cliffs, of grey limestone, absolutely dry, and fringed with scrub and thorny bushes, among which scattered flowers—*Erigeron*, a crucifer or two, a species of balsam and other flowers which I do not know—grow here and there. The heat in these gullies can be terrific, the wind sometimes blows a gale, and the whole aspect of this hunting-ground made me believe, at first, that I had come to a region where butterflies could not exist, save perhaps in winter. Yet I took *Anthocharis belia* g.a. *ausonia* here in some numbers, on March 14th, with two *Melitaea* var. *deserticola*, and, on revisiting the Wadi at the end of April, I took or saw, *Pontia glaucomome*, *Melitaea* var. *deserticola*, *Lampides boeticus*, *Rusticus allardii* (?), a pair of *Polyommatus lysimon*, and, of course, *Pyrameis cardui*. I greatly regret that I have been till now unable to visit these Wadi's in May, when numerous "orange-tips" and "yellow butterflies" are said to frequent them. If the information I have received be correct, it means that species of *Teracolus* are to be taken there. The genus is well represented in the Sudan, three species occur in Palestine, and there is no reason why the Egyptian deserts should not be haunted by some of these waste-loving butterflies.

I spent some time, part of May, June and July, at Aboukir and Alexandria. Both these places, and especially Aboukir, were very poor in butterflies and moths. At Alexandria, *Lampides telicanus* was very common in the Antoniades Gardens, where I also took *Polyommatus lysimon* and *Parnara mathias* and *P. nostradamus*. *Danais chrysippus* and *Colias edusa* occurred everywhere, and I saw several *Pyrameis cardui* in the streets. At Aboukir, I took *Lampides theo-*

phrastus in some numbers, the larvæ feeding on "nabb" (*Zizyphus vulgaris*), and on the sandhills found very small forms of *L. telicanus* and *P. lysimon*. One damaged *Hippotion celerio*, a few *Heliothis*, sp. (larva feeds on tomato), and numerous *Plusia gamma*, *Prodenia littoralis*, *Cyraeda dentalis* and *Sterrha sacraria*, with a solitary *Grammodes geometrica* (?) were my only other catches. In the first week of May I paid a visit to the Margut Steppe, where I saw *Lampides boeticus* and *Pyrameis cardui*, the latter in numbers, with plenty of *Sesia stellatarum* and *Carcharodus lavaterae*, and saw a "blue" which I believe to have been *Polyommatus* var. *abencerragus*, for *P. lysimon*, according to Mr. Marsden, who is well informed about the Alexandrian lepidoptera, does not occur there. The grass land was all burnt by the heat, but a good deal of vegetation—*Phlomis*, thistle, basil, etc.—flourished in the dry rain channels.

On my return to Cairo I at once visited the Barrage Gardens, twelve miles north of the city, and there, in the first week of August, on a very hot afternoon, I saw a ♂ *Hypolimnas misippus*, alas! quite uncatchable, flying like a huge *Limenitis camilla* over the shrubs and low trees. *Danais chrysippus* abounded, and with them were the usual blues—*L. telicanus*, *L. boeticus*, and *P. lysimon*, with a few *Parnara mathias*. I also visited my old hunting-ground at Ezbet el Nakhle, and took a solitary battered ♀ of *Pontia daplidice* there, the only one I have taken in Egypt. I also took worn ♀s of *Hypolycaena livia* flying along an acacia hedge, but no ♂s of this fine Lycænid appeared till the second week in September, when they swarmed both there, at Marg, and in the Ezbehiah Gardens at Cairo. This insect almost always flies high round the tops of hedges and low trees. I have only twice seen it on flowers near the ground, and owing to its rapid flight and the thorns of the "sunt" and "fitneh" acacias, which it frequents, it is very difficult to take in good condition. Females persisted till November 9th, laying their eggs on the terminal buds of "fitneh," from which the green seed-pods are produced in winter and spring, and also on the pods themselves. I took odd specimens of *Chilades trochilus* in several localities near Cairo; numerous *Polyommatus lysimon*, the ♀s taken in October and on to December, as in spring, being largely suffused with blue, and a species of *Parnara*, which I cannot determine, apparently not *mathias*, which was common at the same time, and certainly not *nostradamus*, which abounded in September and October, in partly cultivated ground where clover and vetches were planted.

Megasoma (*Taragama*) *acaciae* and *Earias insulana* appeared in September, and in October I took some yellow aberrations of the last named species in the desert ravines near Helonan, where, in spite of burnt vegetation and blistering heat, *Pontia glauconome* was flying between October 10th and 15th. But to catch *glauconome* is no easy matter. It is the fastest flying butterfly I know, and to follow it with the thermometer at 100° F., through rock and thorn scrub, demands exceptional sprinting powers and a perfect wind. I only took four specimens, all ♂s, and differing very little from one another in facies or size.

Anthocharis belemia, ♂s only, appeared towards the end of November, and, though not common, was seen at several localities near Marg and Ezbet el Nakhle till the end of the year. An attempt to secure a *Syrichthus*—a specimen of which I had seen in a small collection labelled

'Khanka, edge of desert, October,' failed. I saw one, but the insect got away through the glare, and I hope to be more fortunate next April, another attempt to get the insect, October 9th, 1904, having failed through the windiness and cloudiness of the day. The one set specimen I have seen looks like a very heavily-spotted *Syrichthus phlomidis*. It is certainly not *S. malvae*, *S. orbifer*, or *S. nomas*.

I passed the first eight months of 1904 at Alexandria, and, during the spring months, February and March, paid great attention to the Margut steppe, which were then quite green and covered with flowers. Asphodel, anemones, numerous vetches, gladiolus and poppies abounded, but butterflies occurred at the ratio of one to the square rood, and my results for eight visits, including a day in May, were—6 *Thestor ballus* (5 ♂s one much suffused on the forewing with dark grey), 1 ♀ *Lampides boeticus*, 4 *Anthocharis belia*, smaller and slenderer than the Cairo desert specimens, 2 ♀ *Polyommatus* var. *abencerragus* and a few *Carcharodus lavaterae* (taken with one or two doubtful moths in May). The poorness of this year's rainfall and the windiness of these open plains was no doubt responsible for my failure.

At Alexandria I took a fair number of species of Heterocera which have not yet been determined; *H. liria* larvæ gave me a couple of dozen perfect specimens, and Mr. Marsden sent me examples of *Mandnca atropos* and *Zeuzera pyrina*. In September, *P. lysimon* abounded in my garden with *L. boeticus*, but *L. telicanus* was very rare at Alexandria this year, and I only took one specimen of the doubtful *Parnara*. A day at Ezbet el Nakhle in March brought me nothing remarkable but an exceptionally large ♂ *Anthocharis* g.a. *glauce*. My list of species captured or seen is not magnificent. They are as follows:—PIERIDÆ—*Pieris rapae*, everywhere in cultivated districts; *Pontia daplidice*, 1 ♀ near Cairo; *P. glauconome*, in desert ravines southeast of Cairo and east of Helonan; *Anthocharis belemia*, cultivated districts, November to April 6th, most common in the form of the 2nd brood; *A. belia*, desert ravines near Cairo and Helonan and Margut steppes west of Alexandria; *Colias edusa*, common in cultivation, ab. ♀ *helice* occurring now and then [*Gonepteryx* sp? one seen in streets at Alexandria, near docks.] NYMPHALIDÆ: *Hypolimnas misippus*, seen August, 1903, at Cairo Barrage; *Pyrameis atalanta*, rare at Cairo, common at Alexandria; *P. cardui*, everywhere; *Danais chrysippus*, everywhere in cultivated land; *Melitaea didyma* var. *deserticola*, March and April, same habitat as *Pontia glauconome*. LYCÆNIDÆ: *Thestor ballus*, Margut steppe, not common, January to middle March; *Hypolycaena liria*, gardens, hedges, etc., in Cairo and Alexandria; *Lampides boeticus*, everywhere; *L. telicanus*, all cultivated land; *L. theophrastus*, Cairo and local to the northeast of the town, common at Abonkir; *Chilades trochilus*, very local and sparingly northeast of Cairo; *Rusticus* (?) *allardii*, a pair in the desert at Wadi Hof; *Polyommatus lysimon*, everywhere in cultivated land and rarely in the desert; *Polyommatus* var. *abencerragus*, very rare Margut steppe. HESPERIIDÆ: *Carcharodus lavaterae*, Margut steppe, May; *Hesperia*, sp., seen near Khanka, October; *Parnara mathias*, locally common; *P. nostradamus*, locally common; *P.* sp. (?), taken at Cairo, 2 at Alexandria, in autumn.

Synopsis of the Orthoptera of Western Europe.

By MALCOLM BURR, B.A., F.L.S., F.Z.S., F.E.S.

(*Continued from* p. 129.)

GENUS XI: GOMPHOCERUS, Thunb.

This genus is allied to the four preceding genera, but easily distinguished by the clubbed antennæ; the thickening is especially notable in the males.

TABLE OF SPECIES.

1. Carinæ of pronotum straight. (Elytra very abbreviated; wings abortive) .. .. 1. BREVIPENNIS, Bris.
1.1. Carinæ of pronotum sinuate; organs of flight generally well developed.
2. Typical sulcus behind middle; pronotum gibbous; anterior tibiæ of ♂ strongly inflated .. 2. SIBIRICUS, L.
2.2. Typical sulcus in middle or a little in front.
3. Elytra as long as abdomen in ♂, much shorter in ♀; wings shorter than elytra.. 3. LIVONI, Azam.
3.3. Elytra and wings well developed in both sexes.
4. Mediastinal area of elytra dilated at base, with an adventitious vein. (Size medium; colour brown, unspotted; antennæ tipped with white) 4. RUFUS, L.
4.4. Mediastinal area of elytra not dilated, with no adventitious vein. (Ulnar veins diverging from base.)
5. Frontal costa entirely sulcate; antennæ almost as long as body, very broadly clubbed at apex .. 5. ANTENNATUS, Fieb.
5.5. Frontal costa smooth; antennæ hardly exceeding half length of body; antennæ moderately clubbed at apex.. .. .. 6. MACULATUS, THUNB.

1. GOMPHOCERUS BREVIPENNIS, Brisout.

Recognisable by the abbreviated organs of flight, and straight keels of pronotum; it superficially resembles *Chorthippus parallelus*, but the clubbed antennæ, of course, distinguish it. Length of body, 15mm. ♂, 15·5mm.-20mm. ♀; of pronotum, 3·3mm. ♂, 3·2mm.-4mm. ♀; of elytra, 6·5mm. ♂, 3·5mm.-5mm. ♀.

A rare species confined to the Pyrenees, where it occurs in a few grassy places, at an elevation of 5000ft.-6000ft.; Pic du Midi de Bigorre, Le Vernet near Canigou, Pic du Midi d'Ossau; on the road from Barèges to Bigorre, Bagnères de Bigorre, Barèges. On the Spanish side it is recorded from Puigdalp and Nuria, in northern Catalonia.

2. GOMPHOCERUS SIBIRICUS, Linn.

This species is easy to recognise by the tumid pronotum, and the tibiæ of the male, which are swollen into a large pear-shaped globule. Length of body, 19mm.-20mm. ♂, 19mm.-22mm. ♀; of pronotum, 4·5mm.-5·2mm. ♂, 4·5mm.-5mm. ♀; of elytra, 13mm.-15mm. ♂, 11mm.-13mm. ♀.

This species occurs in the higher mountains of Europe, but rarely or never below an elevation of 4000ft. It is not a British species, though an undoubted specimen is recorded from Netley by Stephens. In France, it occurs in the Pyrenees, Haut-Rhin, Cauterets, Barèges, Canigou, Chanrousse (Isère), Dic, Drôme in the spring and summer. In Germany it is doubtfully recorded from the Harz mountains and

Dresden. In the Alps it occurs frequently, in many localities, especially in the southern parts. In the Tirol also, on the Patscherkofel near Innsbruck, and in Italy in the Apennines. In Spain, in the north and centre, Sierra de Peñalara, Navacerrada, the highest parts of the Cordillera Carpentana, and the Pyrenees.

3. Gomphocerus livoni, Azam (? = *variegatus*, Fischer von Waldheim).

Brown or green; antennæ short, little clubbed at apex; carina of pronotum sinuous in prozona; elytra as long as abdomen in ♂, much shorter in ♀; wings a little shorter than elytra. Length of body, 15mm.-16mm. ♂, 19mm.-24mm. ♀; of pronotum, 3·5mm. ♂, 4mm. ♀; of elytra, 10mm.-11·5mm. ♂, 6·5mm.-9mm. ♀.

Differs from *G. sibiricus* in the unswollen tibiæ, and the normal, not gibbous, pronotum of the ♂, by the short elytra of the ♀, and shorter and less strongly clubbed antennæ of both sexes.

Discovered by Azam on the grass round the Lac d'Allos, at 2300m., in the Basses-Alpes.

4. Gomphocerus rufus, Linné.

Easy to recognise by its pale uniform brown colour, strongly clubbed antennæ, tipped with white. Length of body, 14mm.-16mm. ♂, 17mm.-24mm. ♀; of pronotum, 2·8mm.-3mm. ♂, 4mm.-5mm. ♀; of elytra, 12mm.-13mm. ♂, 14mm.-17mm. ♀.

Widely distributed through northern and central Europe; occurs chiefly on grassy slopes, and clearings in woods. It occurs in England at Folkestone, Boxhill, Sheppey, and other localities. In Belgium, at Condroz, Halloy, Chaudfontaine, Longchamps. In France, chiefly in the north, Paris, Vosges, Fontainebleau, Lorraine, Creusot, Tarbes, Allier, Bar-sur-Seine, Mormale, Caraman (Haute-Garonne), Chantilly, Francheville near Lyon. In Scandinavia, Småland, Nerike, Roslagen, Uppland, Umea, and North and West Botten, Lapland. In Italy, at Voltaggio in August and September.

5. Gomphocerus antennatus, Fieber.

Easy to recognise by the very long and very strongly clubbed antennæ. Length of body, 12mm. ♂, 16mm. ♀; of pronotum, 2·8mm. ♂, 3·2mm. ♀; of elytra, 11mm. ♂, 12mm. ♀.

A south Russian species, but it occurs at Oberweiden in Moravia.

6. Gomphocerus maculatus, Thunberg.

Easy to recognise by its small size and speckled, but very variable, colour. Length of body, 12mm.-13mm. ♂, 14mm.-16mm. ♀; of pronotum, 2mm. ♂; 2mm.-3mm. ♀; of elytra, 8·5mm.-10mm. ♂, 9mm.-11mm. ♀.

Common on heaths, moors and uplands throughout northern and central Europe. Lapland, Norway, Sweden, Holland; common in Belgium; in England common on nearly all moors and downs, also in France, and nearly all Germany and Austria. In Spain it is found in the mountains and on the coasts; Arenal del Pasage, Coruña, Fuencebadon, Robla, etc.

Genus XII: Stauronotus, Fischer.

This genus is characterised by the sharply defined fastigium of the vertex, and foveolæ of vertex sharply defined in front; the lateral carinæ are only distinct behind the typical sulcus, represented in front

by white bands, which give the appearance of a cross on the pronotum; the distinct triangular spots on the upper side of the hinder femora are also peculiar.

TABLE OF SPECIES.

1.1. Posterior tibiæ blue	1. GENEI, Ocsk.
1.1. Tibiæ posterior red or reddish.	
2. Yellow bands of pronotum angled and continuous, only interrupted by a short space, fusiform in metazona; pronotum visibly constricted in middle; elytra as long as abdomen at least; prozona and metazona equal.	
3. Foveolæ of vertex trapezoidal; elytra and wings pass hinder knees, former with ulnar area nearly as broad towards apex as the discoidal	2. MAROCCANUS, Thunb.
3.3. Foveolæ nearly rectangular; elytra and wings not quite reaching hinder knees, the former with ulnar area notably narrower than the discoidal	3. BREVICOLLIS, Eversm.
2.2. Yellow bands of pronotum interrupted by a broad space, so only visible at anterior border and in metazona; metazona shorter than prozona; elytra shorter than abdomen	4. CRASSIUSCULUS, Pantel

1. STAURONOTUS GENEI, Ocskay.

Easy to recognise by its small size and bluish or yellowish posterior tibiæ. Length of body, 12mm. ♂, 15mm.-17mm. ♀; of pronotum, 2·3mm. ♂, 3mm. ♀; of elytra, 10mm.-12mm. ♂, 13mm.-14mm. ♀.

A southern species. In France, only in the south and southwest, from July to November, Hyères, Amélie-les-Bains, Cannes, Fréjus, Île de Ré, Landes de Bordeaux, Carcassonne, Le Pouligueu, Bagnols, Montauroux, le Reyran, Montpellier, and Porto Vecchio in Corsica. In Spain and Portugal it is common nearly everywhere; in Italy probably common; recorded from Venice.

2. STAURONOTUS MAROCCANUS, Thunberg.

Extremely varible in size and colour; the smaller variety resembles *S. brevicollis*, but differs in the more vertical frons, the invariably trapezoidal foveolæ of the vertex and the hinder knees, which are always pale in the ♂; generally, it is larger, of a reddish-testaceous colour, with darker markings; the elytra always surpass the abdomen, are subhyaline, with dark spots, and reddish veins. Length of body 17mm.-28mm. ♂, 20mm.-33mm. ♀; of pronotum, 3·2mm.-5·8mm. ♂, 4·2mm.-7mm. ♀; of elytra, 12mm.-26mm. ♂, 15mm.-32mm. ♀.

A southern species, occurring in desert places. In France it occurs commonly along the Mediterranean littoral, from July to October; Hyères, dunes of Vias and Cette, Ramatuel, Saint Tropez. It occurs also in Sardinia, is common in Spain and Portugal, from June to September; also in Sicily. It sometimes occurs in such numbers as to form a veritable pest; this sometimes happens in Spain, though it is not noted in Portugal; in France, it was so numerous on the Camargue in 1901, as to form a plague; it is abundant in north Africa and was the locust that formed the famous pest in Cyprus.

3. STAURONOTUS BREVICOLLIS, Eversmann.

A small species, distinguished from its allies as noted. Length of body, 12mm.-18mm. ♂, 16mm.-19mm. ♀; of pronotum, 3mm. ♂, 3·6mm.-4mm. ♀; of elytra, 10mm.-13mm. ♂, 13mm.-15mm. ♀.

An eastern species; it occurs at Oberweiden in Moravia, and at Bisamberg in Lower Austria.

The var. *hispanicus*, Bol., is fairly common around Madrid from July, and is also recorded from San Martin de Valdeiglesias. Its characteristics are the longer antennæ, stouter build, less arched pronotum and longer femora. Length of body, 12mm.-16mm. ♂, 20mm.-24mm. ♀; of pronotum, 2·5mm.-3mm. ♂, 4mm.-4·5mm, ♀.

4. STAURONOTUS CRASSIUSCULUS, Pantel.

Characterised in the table of species. Length of body, 19mm. ♂, 22·8mm.-25·5mm. ♀; of pronotum, 3·9mm. ♂, 4·5mm.-5·4mm. ♀; of elytra, 10·4mm. ♂, 13mm.-13·2mm. ♀.

A Spanish species, recorded from Salina de Belinchon and Ribas, in June and July.

GENUS XIII: ARCYPTERA, Serville.

This genus is separated by Bolivar from *Stethophyma*, in which the species are included by Brunner. *Stethophyma* includes certain eastern species, which do not occur west of Vienna. *Arcyptera* is defined by the replete foveolæ of the vertex with a narrow discoidal area of elytra, having no vena intercalata; the species are sturdy insects, generally strikingly coloured with black, red and yellow, though *A. flavicosta* is much paler.

TABLE OF SPECIES.

1. Foveolæ of vertex replete, represented only by a punctated space.
   2. ♂ Dominating colour dark olive; knees entirely black in both sexes; elytra ♂ reaching end of abdomen, or beyond hinder knees, all areas regularly reticulated with parallel veinlets, except the discoidal, which is very narrow, almost linear; elytra ♀ short but passing half length of oblong posterior femora. (Wings blackish) .. .. 1. FUSCA, Pall.
   2.2. General colour ♂ bright yellow; knees hinder black in ♂, pale in ♀; elytra ♂ shorter, not reaching hinder knees; the areas differently reticulated, the discoidal as broad, in the middle of elytra, as the radial; elytra ♀ hardly surpass half hind femora, narrow at apex .. .. 2. TORNOSI, Bol.
1.1. Foveolæ distinctly outlined.
   2. Fully winged; colour pale .. .. .. 3. FLAVICOSTA, Fisch.
   2.2. Wings abbreviated; colour dark.
      3. Knees hinder pale .. .. 4. KHEILI, Azam
      3.3. Hinder knees quite black in ♂, and spotted with black in ♀ .. .. 5. BREVIPENNIS, Br.

1. ARCYPTERA FUSCA, Pallas (= *variegata*, Sulzer = *cothurnata*, Creutzer).

Large and stout; yellow, varied with chestnut bands; elytra chestnut, with scapular and radial areas hyaline, anal area often yellow; areas widely reticulated with parallel veinlets, except the discoidal, which is very narrow; elytra surpassing abdomen in ♂, considerably shorter in ♀, in which they are oblong; wings dark smoky; hinder femora yellow above, green outside, crimson inside and underneath, with a yellow annulus near apex; hinder tibiæ and tarsi crimson, with a yellow basal ring; venter yellow; hinder knees *quite black* in both sexes. Length of body, 24mm.-31mm. ♂, 30mm.-

33mm. ♀ ; of pronotum, 5·3mm. ♂, 6mm.-7mm. ♀ ; of elytra, 23mm.-25mm. ♂, 14mm.-28mm. ♀.

This handsome insect is widely distributed in the mountain regions of south and central Europe. In France, it is found in the Pyrenees and Alps ; Larche, Isère, Bagnères, Cauterets, Gavarnie, Canigou, Bagnères de Luchon, Grande Chartreuse, Mont Revard near Aix-les-Bains, Chanrousse, Col du Lautaret. In Spain it is found in Catalonia, and perhaps in the Sierra de Guadarrama. It is found throughout the Jura and the Alps, including the southern slopes of the latter, where it is recorded from Tessin and Sondrio, though it appears rare or not known in Italy. It is found also in the Tirol, near Innsbruck, and in Lower Austria, at Dornbach, Punkersdorf, Mödling, Baden, Gloggnitz, Pfalzau.

2. Arcyptera tornosi, Bolivar.

Distinguished from *A. fusca* by the characters given in the table. Length of body, 22mm.-25mm. ♂, 28mm.-31mm. ♀ ; of pronotum, 5mm. ♂, 6·5mm. ♀ ; of elytra, 20mm. ♂, 12mm.-14mm. ♀.

A native of the hills and mountains of northern and western Spain and northern Portugal ; Santiago in Galicia, Navarredonda, Gredos, Escorial, San Ildefonso ; Coruña, Serra de Gerez, Oporto. Also recorded from Ribas in Catalonia.

3. Arcyptera flavicosta, Fischer (=*cruciatus*, Philippi).

Differs from its congeners in its paler colour ; the elytra of the ♂ are as long as the abdomen ; the colour is paler, and the wings hyaline ; the knees are pale. Length of body, 19mm.-21mm. ♂, 25mm.-28mm. ♀ ; of pronotum, 4mm.-4·2mm. ♂, 5mm.-5·5mm. ♀ ; of elytra, 14mm.-18mm. ♂, 18mm.-21mm. ♀.

Rare, but widely distributed in central Europe. In France it has only been recorded from Mont Salève and near Nice. In Germany, from Berlin, Mecklenburg, the Harz, and Thuringia. In Spain, from Oña, Albarracin, Valencia, and in Portugal at Troia, Beira, Alta, Lisbon, and Alfeite. In Austria, at Oberweiden, Bisamberg, Mödling, and Eichkogl. In Italy, at Voltaggio, in the Apennines at 700m. Very local.

4. Arcyptera kheili, Azam.

Elytra short in both sexes ; wings hyaline, very short ; knees clear. Length of body, 22mm.-25mm. ♂, 30mm.-37mm. ♀ ; of pronotum, 5mm. ♂, 6mm.-7mm. ♀ ; of elytra, 10mm.-12mm. ♂, 9mm.-10mm. ♀.

Discovered by Kheil on the mountain of Lachens and in the plain of Canjeurs in the department of Var in southern France ; also in Spain near Jaca, by the writer.

5. Arcyptera brevipennis, Brunner.

Stouter and larger than preceding ; elytra very short in both sexes ; wings abortive, hyaline ; femora as in *A. fusca*, but knees of ♀ pale, spotted with black ; like *A. fusca*, but foveolæ clear cut, pronotum more tumid. Length of body, 25mm.-30mm. ♂, 35mm.-45mm. ♀ ; of pronotum, 5.2mm. ♂, 7.5mm.-8.2mm. ♀ ; of elytra, 13mm.-15mm. ♂. 14mm.-21mm. ♀.

An eastern species, but has been taken at Brindisi.

Genus XIV: Ramburia, Bolivar.

Characterised in the table; carinæ of pronotum straight, wings rosy; a single species.

1. Ramburia hispanica, Rambur.

Reddish, with a straw-coloured band from the vertex produced backwards to the end of the elytra; organs of flight well-developed; wings smoky at apex, hyaline at base; hinder knees black in ♂, paler in ♀; hind tibiæ bright blue, with a yellow ring at base. Length of body, 17mm.-20mm. ♂, 21mm.-32mm. ♀; of pronotum, 3·2mm. ♂, 5·6mm.-6·8mm. ♀; of elytra, 15mm.-18mm. ♂, 24mm.-27mm. ♀.

This graceful grasshopper is a meridional species. In France it occurs in Provence, but very locally; it has been recorded from Saint Zacharie, Lestaque, Hyères, and the Esterel, and the woods of Sainte Baume, Marseilles, le Reyran, Bagnols. In Spain, it is found along the Mediterranean coast and Andalusia, as far inland as the centre; Uclès, Ribas, Madrid, Montserrat, from July to September; occurs also in Algeria.

(To be continued.)

COLEOPTERA.

A Scarce "Staph" in Middlesex.—On April 2nd, whilst shaking out grass sods into the river Brent, at Ealing, I had the good fortune to capture one example of *Deleaster dichrous*. By further search more might have been obtained, but a rain-storm put an end to operations.—Hereward Dollman.

Rhizophagus coeruleipennis, Sahl., a Durham insect.—This species was taken by Hardy, from beneath the bark of alder, on the southern bank of the Derwent below Gibside, more than half a century ago, and by him described (*Ann. and Mag. Nat. Hist.*, xix., 379) as a new species under the name of *cyanipennis*. In Hardy and Bold's *Coleoptera of Northumberland and Durham*, p. 50, 1852, it is doubtfully referred to as *coeruleus*, Waltl., and is recorded under that name in the revision (*Nat. Hist. Trans. of Northumberland and Durham*, iv., 59, 1871). One of our rarest British beetles, three examples are recorded by Canon Fowler to have occurred in, or near, the Lovers' Walk at Matlock, Derbyshire, singly to Messrs. Matthews, Garneys, and Crotch; and at Crosby, near Liverpool, where an example had been taken by Mr. Taylor (*Brit. Col.*, iii., 267). Hardy's record has evidently been overlooked, and in order that its British distribution may be more correctly known, I give these particulars. The synonymy is as follows:—*R. coeruleipennis*, Sahl.; *aeneus*, Richt.; *coeruleus*, Waltl.; *cyanipennis*, Hardy.—Richard S. Bagnall, F.E.S., Winlaton. *May 2nd*, 1905.

Lathridius angulatus, Man., a Northern Species. This species is somewhat rare with us, but is found occasionally in both the Wear and Derwent valleys. It is recorded by Canon Fowler from various southern localities "Midland District, rare, Repton and one or two other localities; not found further north or in Scotland" (*Brit. Col.*, iii., 280). On going very carefully through the *Lathridius angusticollis* of Hammond in the Bold collection, I find all his examples are to be

referred to Mannerheim's *angulatus*, of which Mr. Newbery kindly lent me an authenticated type for comparison.—IBID.

NEBRIA GYLLENHALI, SCH., VAR. RUFESCENS, STRŒM. (ARCTICA, DJ.), IN THE NORTHUMBERLAND AND DURHAM DISTRICT, ETC.—Perhaps a few records of this variety, lately introduced to the British Catalogue by Mr. Donisthorpe (*Ent. Record*, April, 1905), will not be out of place. It has occurred to me singly, four times in the Derwent Valley during the last three years; thrice by the river-side above Winlaton Mill, and once in Gibside. Two examples are in Bold's collection, one from Skiddaw (Cumberland), June, 1857, and the other evidently local; whilst in the Dick Institute, Kilmarnock, is an example taken in the Ayrshire area. It does not seem to be by any means common. —IBID.

NOTES ON COLLECTING, Etc.

EGGLAYING OF NEMEOBIUS LUCINA.—*Nemeobius lucina* is said by most authorities to deposit its ova on both the upper- and undersides of cowslip and primrose. I, each year, obtain by searching, numbers of its eggs, and during my collecting existence must have found several thousands, yet, although cowslip grows side by side and is practically as common as primrose in its localities, I have never yet seen a single egg on *Primula veris*, although I regularly look for it, and up to now have not seen one on the upperside of a leaf.—H. WOOD, 9, Church Street, Ashford, Kent. *May 7th*, 1905.

ABUNDANCE OF HIPPOTION CELERIO, PHRYXUS LIVORNICA, ETC., NEAR CAIRO.—This year I have had very little time to collect, but on the 16th and 17th of this month, at the Barrage, near Cairo, *Hippotion celerio*, and still more *Phryxus livornica*, swarmed, and I picked up worn *Anthocharis* g.a. *glauce* and *Parnara mathias*. In the desert earlier, February 28th to March 28th, I got a good, though short, series of *Melitaea deserticola*, the larva of which is uncommonly like the description of that of *M. didyma*, and it feeds on *Linaria*, sp.?—P. P. GRAVES, Turf Club, Cairo. *April 21st*, 1905.

ANTHROCERA HABERHAUERI IN JEBEL-BAROUK.—The Anthrocerid, mentioned by Mr. Graves (*antea*, p. 123), and which he sent me to name, proves to be *Anthrocera haberhaueri*.—J. W. TUTT.

EARLY SPRING LEPIDOPTERA IN NORTH DURHAM.—I commenced work in the first week in March, hunting for night-feeding larvæ, and was surprised to find that they were well advanced. This made me work diligently, as I especially wanted larvæ of *Xylophasia rurea* for a friend. This larvæ is very uncertain in its appearance. In 1902, it was entirely absent, as I find no mention of it in my notes. In 1903, on the contrary, one could have collected two or three hundred in an evening. In 1904, again, I could only find five larvæ, when I wanted a number for a correspondent, but this year I have managed, in four evenings' search, to secure about 300. Equally interesting are my notes on *X. hepatica*. For *X. hepatica* this locality, I believe, is the furthest north locality in England, and I am inclined to think this species is becoming more abundant here. We got five larvæ in 1902, seven in 1903, thirteen in 1904, and this year thirty, of which I took thirteen. These figures are the combined "take" of two of us. To secure this larva one needs to be astir early in March, for it pupates

then immediately it is taken. Its food is not only grass, but also dock. Some of the pinker forms of the larva of *X. rurea* are apt to be confused with it, but one can separate them in three ways—(1) The larva of *X. rurea* pupate at least three weeks later. (2) The larva of *X. rurea* is firm to the touch, whereas that of *X. hepatica* is soft and yielding. (3) The primary tubercles upon the underside of *X. rurea* are always black, but on the larvæ of *X. hepatica* they are light brown in colour. The larvæ of *X. hepatica*, like those of *Mamestra furca*, delight in the tufts of grass and dock which grow on the tops of walls. They either pupate in the moss on the wall, or in the space between two stones. I dug a cocoon out of such a place, in 1902, which contained an unchanged larva of *X. hepatica*. Also occurring abundantly upon the dock and plantain were larvæ of *Triphaena fimbria*, *T. ianthina*, *T. comes*, *T. pronuba*, *Noctua baja*, *N. brunnea*, *N. triangulum*, *N. festiva*, *Apleeta nebulosa*, and *Melanippe montanata*. By searching the hawthorns with a lantern, I secured a good number of *N. baja* and *Graphiphora augur* larvæ feeding upon the young shoots at the base of the trees. I only got one larva of *N. ambrosa*, and that was feeding well up a rose-tree in a hedge. At present *Boarmia repandata*, as well as *Abraxas grossulariata*, are just commencing to feed. With the exception of *Noctua xanthographa*, one of the commonest of larvæ has been that of *Naenia typica*. Up to Saturday, I had taken a fair number of *N. typica* from what is its favourite food here, honeysuckle. On Saturday, however, I was collecting black larvæ of *A. grossulariata* for a friend, when I observed the leaves of every plant of *Auricula* in the garden riddled with holes. Curious to know what had caused these, I examined the plants, and found upon every plant, curled up in the dead leaves at the base of the stem, large numbers of larvæ of *N. typica*. I may say that, in the same garden early in February, I found a larva of the same species on the topmost twig of a red currant bush, closely pressed to the bark. This reminds me that I once found a batch of ova of this species laid in my own garden upon currant. Larvæ of *Leucania litharyria* have been fairly common upon grass. In the sallow catkins, larvæ of *Citria flavago* (*silago*) and *C. fulvago* (*cerago*) have been plentiful, but I have not found any larvæ of *Eupithecia tenuiata* this year. I may say I found a larva of *Pieris napi* on January 31st, which pupated safely on February 3rd. I have seen very few imagines, as it is almost useless searching for them, owing to the prevalence of northeast winds here in early spring. Among those I have taken, have been *Taeniocampa gothica*, *Anticlea badiata*, *Hybernia marginaria*, and *Larentia multistrigaria*. The latter were very variable, ranging from very light forms to almost black in some of the males. I took a female *Depressaria heracleana* on March 22nd, and larvæ of *D. assimilella* are still common between spun shoots of broom. Since writing the above I have succeeded in finding larva of the following additional species—*Polyommatus* var. *semiarcus*, *Adscita statices*, *Phoxopteris capitinaeana*, *Grapholitha*, *Eremias coniferana* and *Noctua glareosa*. J. W. H. HARRISON, Birtley, R.S.O., Durham. *May 1st, 1905.*

DURATION OF PUPAL EXISTENCE OF *CUCULLIA CHAMOMILLÆ*.—In July, 1902, I took a few larvæ of *C. chamomillæ* near Fleetwood, from which I had six pupæ. Two of these dried up and the remainder have now emerged as follows—on March 27th, 1903, one; March 1st, 1904, one; the remaining two appearing on March 26th and 29th of this year.

thus having passed three winters in the pupal stage.—W. G. CLUTTEN, 132, Coal Clough Lane, Burnley. *May 10th*, 1905.

AMBLYPTILIA ACANTHODACTYLA IN ESSEX.—Referring to the Rev. G. H. Raynor's note (*anteà* p. 108), I would like to say that, as an old collector in the county of Essex, I frequently met with *Amblyptilia acanthodactyla*, and occasionally in numbers. I find, on referring to my notebook, that, on September 3rd, 1879, I captured 36 in a little green lane about two miles from Witham. *Ononis spinosa* was very plentiful in that lane. I also find that in that year I bred several from larvæ taken from the *O. spinosa*. I considered the insect fairly common in Essex.—W. D. CANSDALE, Sunny Bank, South Norwood, S.E. *May 2nd*, 1905.

WILD PAIRINGS OF DIMORPHA VERSICOLORA.—I was fortunate in obtaining again ova of *D. versicolora*. I managed to get a pairing (wild) on Wednesday, the 12th inst., and another yesterday, the 16th inst. (See *Ent. Record*, vol. xvi., p. 209).—W. E. BUTLER, F.E.S. Hayling House, Oxford Road, Reading. *April 17th*, 1905.

THOUGHTS ON THE PRICES PAID FOR CERTAIN LEPIDOPTERA IN THE MASON COLLECTION.—Being unable to attend the sale of the second portion of the Mason collection, on May 16th and 17th, I have nevertheless—owing to the courtesy of my friend, Mr. J. Alderson—been able to scrutinise a marked list. As the years roll on, one gets very interested at seeing the same specimens brought to the sale rooms from time to time, being re-dispersed only to appear again at some distant date. It is entertaining, too, to note the fluctuations in value (?) of these said specimens. The collection under review included insects purchased from the cabinets of Burney, Briggs, Douglas, Harper, etc. Except for extinct species, rarities, and varieties, there is no doubt that specimens of British lepidoptera are now at a big discount, and examples of average species are only worth the pins they are mounted on. May this be due to the fact that most of our leading entomologists now roam the Continent annually, net in hand, and are more keen on the European Diurni than anything else? We suspect this largely explains matters. What does the comparative beginner think of acquiring 201 specimens, including 56 *Triphaena fimbria* (vars. *virescens*, *solani*, etc.) for the modest sum of 4s.? or 111 insects, including 36 *Taeniocampa populeti*, 38 *T. gracilis*, and vars. of *T. stabilis* for 5s.? Similarly, 317 specimens, including 54 *Tiliacea aurago* (with vars.), and 54 *Mellinia gilvago*, sold for 18s. (Janson); 79, including 15 *Cirrhoedia xerampelina*, 18 *Tethea retusa*, and 16 *Dicycla oo*, for 7s.; 89, including 20 *Aplecta occulta*, and 11 *A. advena* for 14s.; 64, including 14 *Plusia orichalcea*, and 4 *P. moneta* for 5s.; 126, including 18 *Ennomos alniaria*, 22 *E. fuscantaria*, and vars. of *Crocallis elinguaria* for 7s. (Hanbury); fine series of *Cidaria russata* (vars.), 101 for 6s. What does the lover of the "smaller fry" think of obtaining 303 specimens, including 40 *Agrotera nemoralis* and 44 *Endotricha flammealis* for 6s. (Janson)? Similarly, 200, including 14 *Spilodes palealis*, 31 *Botys cinctalis*, and 19 *Lemiodes pulveralis* for 8s. (Nevinson); 67, including 22 *Dichelia grotiana* and 3 *Tortrix gnomana* for 3s. (Hanbury); 191, including 31 *Penthina gentianana* for 6s. (Clark). On the other hand, readers of the *Ent. Record* may be interested to learn that the following species sold at the following rates:—*Chrysophanus dispar* from £2 5s. (Fenn) to £8 (Bower) per specimen; *Laelia coenosa* from

3s. (Newman) to £1 2s. 6d. (Doncaster) per specimen; a var. of *Catocala nupta*, with black hindwings, 10 guineas (Janson). This was the sensation of the sale. English *Catocala fraxini*, with full data, from 5s. to 30s. per specimen; *Boletobia fuliginaria*, from 5s. to 1 guinea for a female (Hanbury); *Agrotis subrosea* from 16s. (Fenn) to £2 5s. (Doncaster) each: *Phibalapteryx polygrammata*, in lots of 4 specimens, from 16s. (Doncaster) to £2 5s. (Druitt): *Crymodes exulis*, from 5s. 4d. (Newman) to £1 12s. 6d. (Janson) per specimen; 1 specimen of *Abraxas grossulariata* var. *varleyata*, £3 (Bower); also 15 vars. for 3s. (Farn), and 10 dark vars. 4s. (Janson), whilst 1 specimen with ground colour of wings yellow, fell to Mr. Bower for £1 2s. 6d; *Dianthoecia barrettii* varied from 12s. for 3 (with others) to 4 for £2 2s. (Hanbury); *Cleora viduaria* sold in lots of 2 specimens from 9s. (Hanbury) to £1 8s. (Hanbury). Among the "micros," *Crambus myellus* averaged 1s. per specimen, and 4 specimens of *Ditula woodiana*, bred by Dr. Chapman in 1894, for £1 (Nevinson). The sale was remarkable for the extremely limited number of buyers, among whom were noted Messrs. Bankes, Bower, Clark, Doncaster, Farn, Fenn, Hanbury, Janson, Newman, Nevinson, and Porritt.—H. E. P.

LARVÆ OF THECLA W-ALBUM.—I tried for *Thecla w-album* this morning on wych elm here, and got the three small ones I now enclose.—G. H. RAYNOR, Hazeleigh Rectory, Maldon, Essex. *May 19th*, 1905.

EXTENDED PUPAL STAGE OF LACHNEIS LANESTRIS.—ERRATUM.—By a misunderstanding the first part of my note (*antea* p. 132), *viz.*, that relating to the extended pupal period, is stated to refer to *Dimorpha versicolora*. It should have been *Lachneis lanestris*, see *Ent. Rec.*, xvi., p. 209. W. E. BUTLER, F.E.S., Hayling House, Reading. *May 17th*, 1905.

LOCALITY LISTS OF HESPERIIDS WANTED.—Will our readers please send me lists of any of the "skippers" (local or common) they have ever captured in Britain, giving localities (including county), and date if possible, and the habitat? Also any county list of these butterflies, with authority noted in each case. If those friends, to whom I usually write for such help, will send on in answer to this appeal it will save me much time.—J. W. TUTT.

SCIENTIFIC NOTES AND OBSERVATIONS.

CROSSPAIRING OF TENIOCAMPA GOTHICA AND T. STABILIS, AND HATCHING OF OVA. Six weeks ago, shaking sallow for Taniocampids, I took *Taniocampa gothica* ♂ and *T. stabilis* ♀ paired; a few days later the female deposited ova, and a week ago the larvæ emerged and are now feeding, some upon sallow and others upon elm, and appear to be thriving. I do not know if this is an uncommon occurrence or not, but I can hear of no one with a similar experience. It seems to me, however, that it cannot be at all common. The night I took them *T. gothica* and *T. stabilis* swarmed, they were all over us after each shake, and flying in all directions, so that there were plenty of ♀ *T. gothica* that the male might have mated with. I was advised to state the facts to you, as at least interesting, and if you (or your readers) are able to give me any information of similar cross-pairings I shall be very grateful.

T. stabilis this year has been more varied in form than I have ever known it before.—H. W. Weaving, Pewet House, near Abingdon. *April 25th*, 1905.

Protective resemblance of larva of Thecla w-album to its foodplant.—I do not know whether it has been noted before, but this year I have been much struck by the wonderful mimicry of the larva of *Thecla w-album*. The larva is found on the underside of the leaf, and seems to prefer the young ones, and when at rest it holds by its anal claspers to the midrib at the bottom of a leaf growing at the end of a twig, the body resting on the leaf alongside the midrib, which is exactly the same position as that taken by a young folded leaf of the wych elm, and at first glance you can hardly tell "t'other from which." The oblique lines on the larva look like the depressions between the veins, and the ridges divided by the dorsal line resemble the serrated edges of the young folded leaf.—J. T. Bird, The Nurtons, Tintern, Monmouth. *May 22nd*, 1905.

HEMIPTERA.

Zicrona cœrulea, L.—a correction.—Since writing the note recording this Hemipteron as new to the Northumberland and Durham district (*Ent. Rec.*, xvii., 47, 1905), Mr. Gill, Curator of the Newcastle Museum, sent me a reprint from the *Natural History Transactions of Northumberland and Durham*, iv. (1872), which included a list of our local *Hemiptera-Heteroptera* by T. J. Bold. *Z. coerulea* is therein recorded from Gilsland, Prestwick Carr, Wooler, etc., although these localities are not mentioned in Mr. Saunders' work, to whom, perhaps, Bold's list is unknown.—Richard S. Bagnall, Winlaton. *May 2nd*, 1905.

CURRENT NOTES.

The last monthly meeting of the Entomological Club was held at 4, Lingards Road, Lewisham, S.E., on Friday, May 12th, 1905, at half-past six o'clock, when Mr. R. Adkin was the host. Tea having been served by Mrs. and Miss Adkin, an adjournment was made to the library where matters entomological were discussed. Supper was served at 8.30 p.m., when Messrs. Distant, Donisthorpe, Jäger, A. H. Jones, Lucas, Porritt, South, Tutt and other members and friends sat down. A most enjoyable evening was spent.

Mr. Levi W. Mengel announces that his *Catalogue of the Erycinidae of the World*, with the synonymy brought down to October 1904, is now running through the press, and will be ready for distribution some time during the next few weeks.

We are pleased to be able to state that Mr. C. O. Waterhouse has been appointed Assistant Keeper of the Insect Section of the Zoological Department in the Natural History Museum. This post has been vacant since Dr. Butler's retirement in December, 1901. The Trustees determined to make a new appointment in December, 1904, but, owing to unforeseen circumstances, Mr. Waterhouse was only appointed on April 11th of the present year. Mr. Waterhouse has been in the museum for 38 years.

NOTES ON LIFE-HISTORIES, LARVÆ, &c.

HABITS OF LARVA OF ÆGERIA CULICIFORMIS.—I have recently been paying some attention to the feeding-habits of the larva of *Ægeria culiciformis*, which is common in the woods here. The female, of course, flies in early June, and then selects the stumps where the undergrowth of birch has been cut down during the *previous* winter. Apparently the egg is inserted into the bark some three or four inches below the cut surface of the stump. The larva feeds upwards, between the bark and the wood, but eating the wood (in which a groove is fed out) and not the bark. The frass is allowed to accumulate in this groove. When approaching within an inch or two of the cut surface the larva burrows in a slanting direction into the wood, until it reaches almost to the surface, where it pupates. Barrett, I see, states that it probably feeds for two years, but I do not think that this is so, for, at the present date, the larvæ are fullfed from last summer's ova, and have spun their cocoons, though they have not yet pupated. The best way of obtaining the pupæ seems to be to insert a sharp chisel between the edges of the bark and the wood, and to peel the bark off. The accumulation of frass will indicate where a larva has been feeding, and short search will show the entrance of its burrow into the wood. Some two or three inches of the stumps must then be sawn off, and carried home, to be placed in a breeding-cage for the insect to emerge. Unfortunately the woodpeckers and tree-creepers seem to have exact knowledge of the presence of the larvæ, and readily extract them through holes cut in the pecked surface, so that probably not more than two or three per cent. of the larvæ reach maturity and successfully emerge. PERCY C. REID, F.E.S., Feering Bury, Kelvedon. *March 5th*, 1905. We wonder whether our correspondent can get us the egg, or learn anything definitely about the mode of egg-laying. ED.

EGGS OF LEPIDOPTERA. *Ennomos obfuscata.*—Oval in outline, about 1mm. in length, ·8mm. in width, plump, but with a slight depression on the upper surface, ends somewhat flattened so as to make shape approach the cylindrical; surface covered with an exceedingly faint, coarse polygonal reticulation, with further traces of white points at the angles, giving the idea of the longitudinal zigzag ribs of *Hemerophila abruptaria* without the marked definition presented by the ribs of this species; dull pale green in colour, with certain irregular reddish patches and dots (evidently embryonic structures showing through); the micropylar area flattened, the micropyle itself forming a central stella with a ring of hexagonal cells surrounding it, these being in turn surrounded by a ring of larger cells which reach practically to the shoulder of the egg. The surface itself is iridescent and the coarse boundaries of the cells are pinkish white. The eggs sent are loose, but the comparative smoothness of the underside suggests that there may be some attachment. Received from Dr. Chapman on July 7th, 1899. Eggs laid by female captured at Fusio.

Cosmorhoe ocellata.—Very small egg for a Geometrid. Colour very pale straw yellow with a faint greenish tint, about one fortieth of an inch long, length, breadth and height ·5 : ·3 : ·2, somewhat broader at micropylar end. Roughly oval in outline, with a slight oval depression on upper surface. Hexagonal reticulation very fine, and about 12 to

length of egg, the meshes themselves broad and rounded, the depressions shallow so that there are no sharp points or edges about it. [Laid April 12th, 1898, by ♀ taken at Cannes; four eggs on lid of box, two of which are laid on long side another partly tilted on one end.]

Spilosoma mendica.—·75mm. in diameter, height about ·7mm., about two-thirds of a sphere; laid in batches, and just touching each other. Pale straw-colour, very shiny; very slenderly reticulated with a rather large irregular polygonal (chiefly pentagonal) reticulation. The apex around the micropyle for some distance covered with a much finer reticulation than the rest of the surface, but none of the details at all distinct in the newly-laid egg. [Eggs described May 12th, 1899, laid May 11th, and sent by Mr. H. J. Turner.]

Adscita statices.—Eggs laid very regularly in small batches on inside of box. The eggs side by side and just touching each other, and in no wise overlapping. The eggs are laid on their long sides, bright yellow in colour, roughly oval in outline, but flattened and depressed at the top. The upper surface considerably depressed, the depression is roughly oval in shape. The egg is somewhat squared at one end, but becomes broader at the opposite end before rounding off at that end, and shows distinctly the longitudinal striations, which, though fine, are plainly visible over almost the whole surface of the egg. The micropylar end and its nadir apparently smooth. The micropyle not distinguishable with a two-thirds lens used as a hand-glass. Measurements about $\frac{1}{80}$in. in length, $\frac{1}{40}$in. in breadth, $\frac{1}{60}$in. in height. [Described April 24th, 1898, from eggs laid by a ♀ taken at Pegomas.] —J. W. Tutt.

Cleogene peletieraria—[Laid at Puerto de Pajares. July 14th, 1904.] Nearly white, egg-shaped, long axis about ·90mm. to ·92mm., transverse diameter 0·6mm., there is not much difference in the two transverse diameters, as very little flattening laterally is present. The sculpture is a network of very slightly raised lines in a hexagonal pattern, the lines of hexagons running nearly longitudinally. The individual hexagons have a diameter of about 0·0125mm., so that there are about 75 in the length of the egg. The pattern is so little raised that one would call it a smooth shining egg.—T. A. Chapman, Betula, Reigate.

Erebia embla.—The egg forms an almost regular oval in outline, rather fuller at the base than at the apex. It is as nearly as possible 1·1mm. long and ·85mm. wide. By the time the egg reached me (July 4th) it was of a whitish hue thickly mottled over with irregular brown dots. The shell is shiny, and there are 35 rather wavy irregular longitudinal ribs, which become much fewer in number towards the apex owing to adjacent ribs uniting together. About 15 ribs pass over into the micropylar basin, a very shallow depression occupying the greater part of apical area of the egg, and these merge into an irregular reticulation of an opaque whiteness at the base. At the central point of the depression are two dark brown points, the micropyle proper. There are no real transverse ribs, although traces of such appear somewhat irregularly at the sides of the longitudinal ribs, and the basal part of the egg has a moderate development of such ribs. [Described July 4th under a two-thirds lens from an egg sent by Dr. Chapman on June 30th, 1898, from Saeterstöen.]—J. W. Tutt.

Nola chlamydulalis.—[Laid April 8th, 1898, by ♀ captured at

Cannes.] Pale straw-yellow in colour; upright, ribbed egg, but oval in horizontal section, longest diameter about $\frac{1}{70}$in., shortest diameter about $\frac{1}{80}$in., and height about $\frac{1}{90}$in. Upright ribs about 48 in number, transverse ribs apparently dividing them into a number of pearly shining nodules, but these are really the hollows; towards the crown of the egg, the primary ribs appear to carry a number of very fine spicules arising at the intersection of the transverse ribs; top flattened, magnifying power not equal to determining the nature of the micropylar area; underside appears to be smooth.—IBID.

TAMARISK-FEEDING LEPIDOPTERA.—I beat the tamarisks to the east of the cabins at Almanarre, near the sea (between Hyères and Carqueiranne) to-day, September 11th, 1904, with very good results. Larvæ of *Pseudophia illunaris* were more abundant than any others, but *Agdistis tamaricis* ran them close. In less than a couple of hours, and from about half-a-dozen trees, I knocked out between 60 and 80 larvæ of the former, in all stages, from the 1st up to the penultimate. (1) *Pseudophia illunaris.*—The young larvæ of this species are light (but bright) green with white markings up to the 4th stadium (1st stadium pale grey-green, semi-transparent, and with darker marks). The skin in the 4th stadium is variable in colour, but generally reddish or reddish-grey (like the smaller twigs), lighter underneath, sometimes greenish. In the 5th and 6th stadia, the colour is darker and colder grey, the colour of the larger branches and trunks on which these older larvæ rest. In all stages, they are so extremely like the part of the tree on which they live that it is most difficult to detect them, and very few would be found unless beating were resorted to. The same thing applies to the other larvæ on tamarisk. (2) *Agdistis tamaricis.*—The curious, slowly moving larva of *A. tamaricis*, so well represented by Millière, is abundant. There are at least two broods in the year if not more. I knocked out a few small ones, but most were nearly fullfed. I also knocked out an imago. The imago at rest assumes a remarkable attitude, the wings folded and raised over the head like two long palps. The uniform grey variety of the larva was not rare. (2) *Gelechia plutelliformis* (*olbiaella*, Mill.).—The larva of another species of which I found a half-dozen to-day, and which I had found before (frequently in June), is long and thin, about the thickness of a bit of the tamarisk foliage, which the larva absolutely resembles. It is green with a yellowish-white lateral line, enlarged by a wedge-shaped projection on each segment, rising obliquely backwards and shaded in front by a brown-green oblique mark. There is a narrow double dorsal line of pale yellowish-green. Head, greenish; larva tapers towards the end of the body; anal claspers stretched out behind, something as in *Pseudophia illunaris*; segments rather swollen and incisions deep; walks rapidly, taking very short steps, and throws itself about violently if touched, jumping like a Buprestid beetle. I once found a yellowish-fawn coloured variety (Ste. Maxime, August 28th) of the larva. I have not yet reared an imago. (4) *Macaria aestimaria.*—The larva of this species is not very common. I got six specimens to-day, including what may be simply a variety or may be another species. It is similar in shape, but has a smaller head (perhaps it has another moult to pass), and instead of being bright green with white marks, it is a pale tea-and-milk colour with M-shaped, brownish marks on the dorsum on each segment, the base of the M towards the head, it has some yellowish lateral marks; venter lighter than

[illegible] A ♂ and ♀ specimen of *M. destinaria* also emerged to day, [illegible] having been taken at Ste. Maxime on August 28th. (5) A 5th [illegible] to day is shaped like the *Dorcynium* proboscis beetle larvae [illegible] last June. It is pale green with a whitish dorsal stripe, [illegible] what Lycenid shape. I think it is the larva of a com[illegible] green proboscis beaked beetle found on tamarisk. I found [illegible] little beetle on this tree, deep mahogany colour. H. [illegible] 7 Rue Mireille, Hyères, France. *September 11th*, 1904.

[illegible] AND YOUNG LARVA OF POLYGONIA CALBUM. Three eggs [illegible] setting board by a ♀ in the possession of Mr. Foljambe. [illegible] on the afternoon of April 14th. The [illegible] were then [illegible] Shape, truncated cone, rounding off abruptly near the [illegible] has a circular depression. Between the edge of the [illegible] and the micropylar circle on top [illegible] fall [illegible] These ribs are marked with [illegible] of the transverse ribs on the [illegible] surface, where [illegible] The surface of the [illegible] The walls [illegible] The micropylar area, [illegible] [illegible] 0·7mm. One [illegible] 15th and [illegible] The other [illegible] 2·2mm. [illegible]

REVIEWS AND NOTICES OF BOOKS.

[illegible] 1904 [illegible] H. W. [illegible]

[illegible]

Warwickshire as far as was known up to the date when it was compiled. Mr. Ellis, living in the county, having collected there for a good many years, and having been a friend of the late Mr. Blatch, whose fine collection is now in his possession, was the right man to write this list, and we congratulate both the publishers and him on the result. As Mr. Ellis points out, a county boundary is an artificial one, he, therefore, in his introductory remarks, touches on some of the more remarkable species which, though not found in Warwickshire, are found close by in other parts of the Midland plateau. Before entering into the body of his paper, Mr. Ellis gives a table showing that, out of some 3264 species of British coleoptera, 1663 are found in Warwickshire. The nomenclature followed is that of Sharp and Fowler's *Catalogue* of 1893. It may be as well to mention a few of the more remarkable species dealt with in this list:—(1) *Amara nitida*, Stm. This extremely local species has been taken freely in moss and turf at Knowle by Mr. Blatch and our author. The only other known locality in Britain is Bath, where it was taken by Dr. Gillo. (2) *Phlaeopora corticalis* var. *transita*, Muls. Taken under bark at Sutton Park by Blatch. The only mention of this variety by Fowler, is of a British specimen sent to him by M. Fauvel, without locality. (3) *Homalota dirisa* var. *blatchii*, Ellis.—Taken first by Mr. Blatch in dead moles and hedgehogs, and afterwards by Mr. Ellis in dead moles at Knowle. (4) *Myrmecoporus clavicornis* var. *forticornis*, Fauv.—Found with the type at Coleshill. In the latest *Catalogue of British Coleoptera*, 1904 (Beare and Donisthorpe), this variety was not included because all previous evidence appeared to be too doubtful, it will now, of course, have to be added to the British list. (5) *Homalium septentrionis*, Th.—Mr. Blatch's record of this beetle from Knowle was the first one since Fowler, who notes it from the south of Scotland. It has since been taken in Cumberland (Day), at Guildford (Champion), Bradfield (Joy), West Malling (Donisthorpe), and we have taken it at Market Bosworth in Leicestershire. (6) *Sacium pusillum*, Gyll. One specimen was taken on an orange by Mr. Blatch's son in a cupboard in his house at Small Heath. The only other British record is one taken by Woolaston many years ago, it was accidentally destroyed. (7) *Elmis subviolaceus*, Mull. Taken by Blatch at Knowle. This is a very local beetle, its nearest locality is Repton; also recorded from Ripon, Llangollen, Northumberland, Scotland, and Ventnor, Isle of Wight. (8) *Chrysomela orichalcia* var. *hobsoni*, Steph. Taken by Blatch at Alcester. Only recorded by Fowler from Manchester, Crohamhurst, and Honnington. Since taken by Bagnall at South Hylton. (9) *Meloe cicatricosus*, Leach. "Stratford-on-Avon (Bloom)." This appears to be a most extraordinary record. It is a sea-side species, and has only been recorded from Margate, Ramsgate, St. Peters, Deal, and Dover! In the perfect state it feeds on sea-side plants. (10) *Rhytidosomus ilicis*, Hbst. Taken by the late Mr. Blatch and our author on aspens in woods near Knowle. The other localities given by Fowler for this scarce species are Wimbledon, Hampstead, Coombe Wood, New Forest, and Langworth Wood, Lincoln. It has since been taken by Messrs. Walker and Chitty in the Bleau Woods, and we have taken it on Wimbledon Common. We are inclined to attribute the extreme scarcity of this species, even where it does occur, to the fact that it *drops to the ground* at the least movement. HORACE DONISTHORPE.

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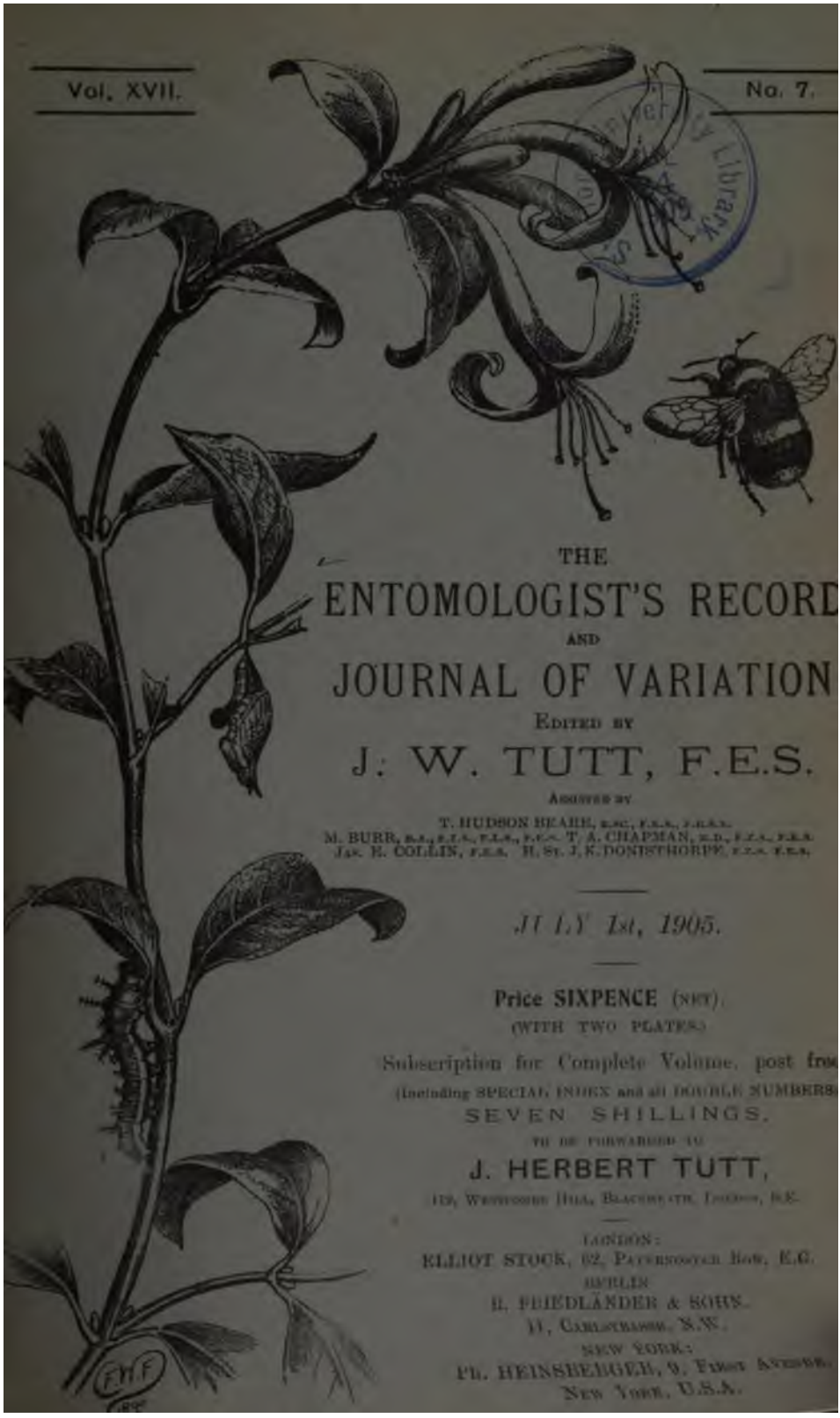

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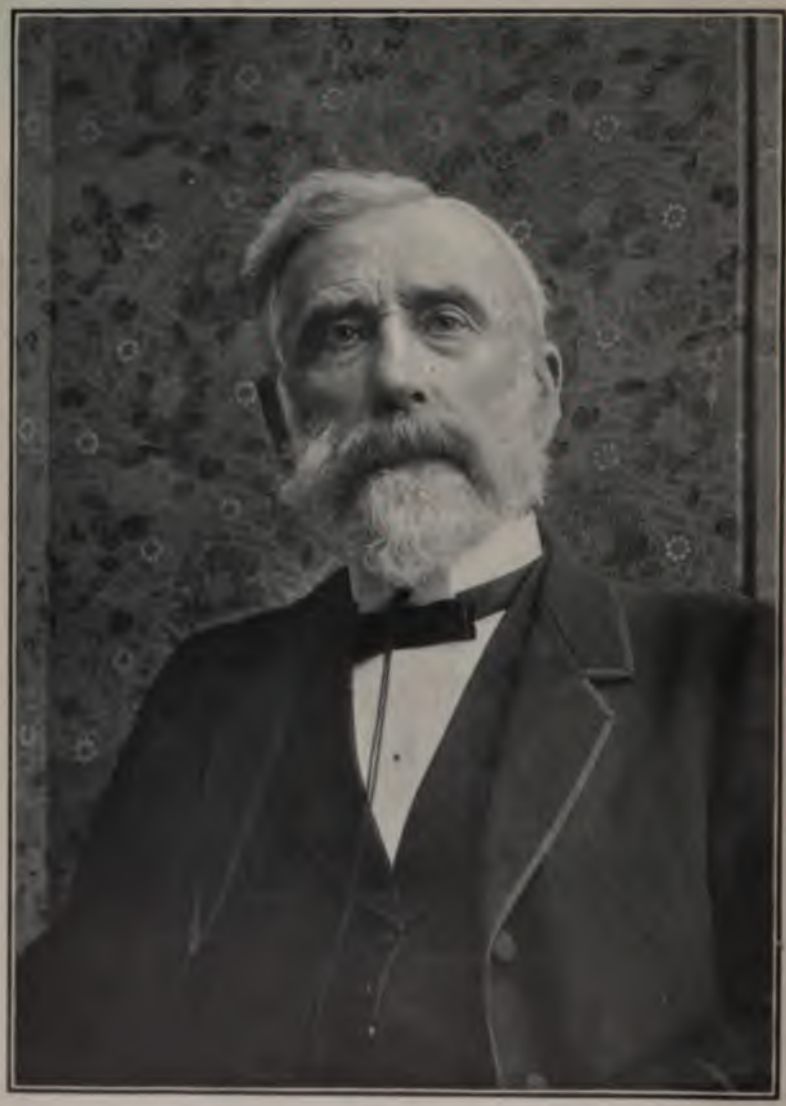
Fig. 1. Pupal skin of Chrysophanus phlæas × 120.

Fig. 2. Pupal skin of Chrysophanus phlæas × 200



H. de Saussure

Henri de Saussure (with port[illegible]).

(Born November 27th, 1829. Died February 20th, 1905.)

S[illegible] has lost a very eminent servant in the person of Henri de Saussure. The famous Swiss entomologist, who had been for some years in failing health, passed away peacefully at his residence at Geneva on the morning of Monday, February 20th.

He was a distinguished member of [illegible] Mongin de Saussure (1469 to 1541), Seigneur of Dompmartin [illegible] at the Court of Lorraine [illegible]. His son, Antoine (1514 to 1569), embraced the Reform [illegible] and [illegible] into prison, from which he [illegible]. He [illegible] at Neuchâtel, then at Geneva, and [illegible]. His [illegible] Elie, [illegible] of Morges [illegible] Geneva, where he became a burgess [illegible] 1635. Many of his descendants played a prominent [illegible] part [illegible] of their country. Six were members of the Council [illegible] one was Syndic, which [illegible] at the Court of St. James. The [illegible] of [illegible] Elie was Horace Bénédict de Saussure [illegible] and his grandson Henri de Saussure [illegible] by his recent death [illegible].

Born at Geneva on November 27th, 1829, [illegible] education at [illegible] of [illegible] at Hofwyl [illegible] the development [illegible]. He [illegible] of the [illegible] entomologists [illegible] of the [illegible] returning to Geneva [illegible] under Pictet [illegible] great [illegible] Agassiz [illegible] of insects [illegible] of the Société [illegible] Paris [illegible] where he [illegible] In 1852 [illegible] of Paris and in 1854 [illegible] of Doctor.

In 1854 [illegible] [illegible]

[illegible] 1st, 1905.

France, 1857), his notes on the *Volcan de Jorullo* (Lausanne, 1859), and on *Le pic d'Orizaba* (1858), his *Description des ruines d'une ancienne ville mexicaine* (Paris, 1858), *Mémoire sur quelques Mammifères du Mexique* (Paris, 1860), and various other articles on the birds, myriapoda, mammals, crustacea, and ethnology of the country he was visiting. How great must have been the fascination of so grand a tour in this splendid, and then little-known, land, upon a nature so receptive, so educated, and so enthusiastic.

While in the New World, de Saussure visited the United States, where he made the acquaintance of Louis Agassiz and of Henry, chief of the Smithsonian Institution, and many other distinguished American naturalists. His interest in volcanoes did not die out on his return to Europe in 1856, for, in the seventies, he published various notes on eruptions of Vesuvius and Etna. The variety and versatility of his occupations are seen in some other of his publications at this period. Among those dealing with agriculture we may specially mention *Mémoire sur la manière d'atteler les bœufs*, which received the gold medal of the Société centrale d'Agriculture de France, and a report upon the damage done to vineyards by *Phylloxera vastatrix*, which attracted the attention of the Federal Council, and, ultimately, led to legislation forbidding the introduction into Switzerland of foreign plants, which marked the beginning of the long struggle against this terrible economic pest. At this period, he began that splendid series of works on Hymenoptera and Orthoptera, which made his name so famous. Of the former we may mention *Nouvelles considérations sur la nidification des guêpes* (Geneva, 1855), *Études sur la famille de vespides* (Paris, 1852-57), *Synopsis of American Wasps* (Washington, 1875), on the *Hymenoptera of the Novara Expedition* (Vienna, 1867), *Mélanges hymenopterologiques* (fascicules 1, 2, Geneva, 1854 and 1863), *A Catalogue of the genus Scolia* (in collaboration with Jules Sichel, Paris, 1864), *On the Scoliidae of Fedtchenko's Voyage in Turkestan* (Moscow, 1880), *Note sur les Masariens* (Paris, 1853), *Note sur les Organes buccaux des Masaris* (Paris, 1857), *Histoire naturelle des Hymenoptères de Madagascar* (Paris, 1890), and a host of smaller papers and articles.

But it is as an orthopterist that the name of Henri de Saussure will chiefly be remembered. Of his *Mémoires pour servir à l'histoire du Mexique, des Antilles et des Etats-unis*, the third part is *Orthoptères l'Amérique moyenne* (1864), and the fourth is on *Mantides américaines* (1871). The Minister of Public Instruction at Paris (1870) ordered the publication of a fine work, entitled *Mission scientifique au Mexique*, by de Saussure. In 1894, he described the orthoptera collected by Fedtchenko in Turkestan. At intervals between 1863 and 1898 he brought out the different parts (six) of *Mélanges orthoptérologiques*, which form two stout quarto volumes, containing a variety of really important works, chiefly on *Blattidae* and *Mantidae*, but, of especial value, is the monograph of the crickets, which occupies the fifth and sixth fascicules. This is to the present day the standard work on the crickets, and though very many new species have been described since, no attempt has been made to supersede this monograph.

Between 1859 and 1870 he published a number of short papers, chiefly descriptive, and in 1879, *Spicilegia entomologica genavensia*, I., *Genre Hemimerus*. He proposed the establishment of a new

order for this anomalous insect, but it is now known that he was misled by a faulty preparation. The continuation of his series was II., *Tribu des Pamphagiens* (1887), which was followed by a series of similar monographs of some of the more restricted families of the Orthoptera: *Prodromus Œdipodiorum* (1884), and the *Additamenta* thereto, four years later, deal with the *Œdipodidae* of the world, then *Synopsis de la tribu des Sagiens* (1888), shortly followed by a *Note supplementaire*, and then revisions of several families of cockroaches, the *Panesthidae* and *Epilampridae* in 1895, the *Perisphaeridae* in the same year, in collaboration with Leo Zehntner, who also assisted him in the great work in the first volume on Orthoptera in the *Biologia Centrali-Americana*, on the *Blattidae* and *Mantidae*, and an analogous work on *Blattidae* and *Mantidae* of Madagascar, in Grandidier's great publication. In collaboration with Alphonse Pictet he produced a *Catalogue d'Acridiens* (1887), *Iconographie des Sauterelles vertes* (1892). His smaller brochures and pamphlets were very numerous, and it is not necessary to mention them all.

The question of the origin of mankind particularly appealed to this all round naturalist, and he formed a very valuable ethnological and archæological collection, which he presented, with his usual generosity, to the Geneva Museum. In 1868, he explored the cave of Scé, near Villeneuve, where, with scrupulous organisation, he discovered traces of human habitation contemporary with the reindeer.

In 1858, in company with six friends, he founded the Geographical Society of Geneva, of which he was President in 1888-1889. He represented the Society at the international congresses held at Paris in 1875 and in 1889. From 1857 until the appointment of the Director, Professor Bedot, de Saussure was a member of the committee which managed the Natural History Museum of Geneva. Colleagues of his were his old professor, F. J. Pictet, Dr. Brot, and de Loriol-le-Fort. He threw himself with characteristic enthusiasm into the task of arranging and organising the collections. In spite of advancing age and decreasing strength, he worked with regularity at the herculean task of naming and classifying the Orthoptera of the museum, while, at his villa at Genthod, he organised his collection of Hymenoptera, which he presented to the town last summer. His work at the Orthoptera, for the benefit of the museum, was enormously to increase the value and the comprehensiveness of the collections, to which he added the splendid specialist library which he had accumulated during his many long years of assiduous work.

In 1897, he was presented with an address and artistic souvenir, on behalf of the municipal authorities, in recognition of his forty years' service at the museum of his native town. Honours were showered upon him by the leading scientific institutions of the world; he was elected an Honorary Fellow of our Entomological Society of London, in 1872.

In addition to the loss to science in general, there are very many who feel a personal loss in the death of Henri de Saussure. Those who knew him were fascinated with the unfathomable depth, as well as by the variety, of his knowledge and reading, as also by the brilliance and wit of his conversation. Many who had never had the privilege of personally meeting him, knew him as a charming and courteous correspondent. His colleagues, however humble, he was

ever ready to assist with his stores of knowledge, and he would generously offer his hospitality, and invite his friends and correspondents to Genthod, his picturesque villa on the shores of the beautiful Lac Leman. He was a great man of science, and many notices have appeared, and will appear, recounting his life and work, but, from the nature of things, few of such notices will be written by men who knew him intimately, or even personally. Let us hope that someone who was his contemporary, who knew him well and understood him, will give us a detailed and sympathetic account of this distinguished man of science, who had travelled, seen, read, and worked so much for so many years.—M.B.

Notes on the Melanism of Larentia multistrigaria in the neighbourhood of Skelmanthorpe (Huddersfield).

By B. MORLEY.

On the high commons bordering the moors of the Southwest Riding, *Larentia multistrigaria* has shown, of recent years, a very decided tendency to melanism, but, so far as I am able to ascertain, the phenomenon seems to be confined, at present, to the moor edges. On the slopes of the Dearne watershed *L. multistrigaria*, during April last, appeared plentifully, and quite half the specimens were more or less melanic, many of them being quite black, except for a few grey lines across the wings. The best melanic specimens come from a bleak, open, wind-swept common, with scarcely any shelter, except the rough sandstone-boulder walls which fence the fields. Here trees are few, and very stunted, and there are no hedgerows. These slopes are from 1000ft. to 1200ft. above sea level, falling in an eastern direction, and the soil is a cold, damp, black clay. It is a curious fact that, with these smoky forms, a very light grey form also occurs, and, on favourable evenings, specimens of the different forms may be found on the walls paired, apparently interbreeding with each other without discrimination, and suggesting not only that two separate races do not exist, but that, in the near future, the race may become entirely melanic. It seems highly probable that, in this district, the species is fast following *Amphidasys betularia* in its melanism, the latter species having, as I am informed, changed in this locality within about 25 years, from the ordinary form to one almost black (only the head and a small dot at the base of the forewings remaining white). I may add, however, that, during the ten years that I have collected lepidoptera, I have only found the form *double lagaria*.

There are many West Riding species developing melanism, but I know of no other species where this particular form of development is confined to a locality, *viz.*, in this district, in every other species subject to variation, any of the various varietal forms may, and do, occur wherever the species is found. With *L. multistrigaria* this is not so at present for, on the slopes of the same valley, only four or five miles distant from the melanic region, the species is abundant, but shows no melanism whatever.

With regard to the distribution of the species and its habitats in this district, there are, besides what I have called the melanic region, various localities in which it occurs, *viz.*, (1) East of the melanic region on the south side of the valley, for about six miles, the hillside gradually

sloping from an altitude of 1200ft. to 600ft. on the hill-top. Where the food-plant, *Galium saxatile*, grows more or less abundantly by the stone walls, the species appears accordingly. (2) In Deffer wood (700ft.), four miles east of the melanic region. The species is common, and (3) Two miles further east, on High Hoyland bank (600ft.) it is also common. All the specimens that I have seen in these lower localities are of a light form. Here, the vegetation is altogether more luxuriant, the district very well wooded and well inside the wheat-growing area. It follows that the lowland light form is not nearly so exposed as the dark form on the hill-top. It is generally slightly larger also. The upland race, however, must have endured exposure for ages, and it is by some considered that melanism has only very recently been developed.* What then can be the cause of this development? If smoke be the agent it seems to act in the wrong direction, for, on the hills where the dark race is found neither chimney-stacks nor houses exist (except a few small scattered farms, the smoke from which can have little or no effect), while down the Dearne valley many mill chimneys are pouring forth daily black volumes of smoke upon the surrounding hillsides, assisted by the grey clouds from the chimneys of houses in many villages, and yet, on these hillsides, where the western winds carry most of this impurity, the light race only occurs. I confess that I fail to see how smoke can be the agent, for, even if it be allowed that the east winds carry as much smoke on to the western slopes as the west winds do in the other direction, allowing smoke to be the cause, we should expect to find melanism general; but one has only to look at trees growing on the south Yorkshire uplands to be very soon convinced as to the direction of the prevalent winds, for invariably, in exposed places, they have practically a naked side to the west, the branches hanging out towards the east. Geologically, however, the conditions are very different. The light race occurs on the borders of the upper and lower coal measures, but directly the narrow belt of the lower coal measure is passed, and the millstone grit is approached, the species gives way to melanism. How the geology of the district does influence the species may be hard to say, but all the conditions must be considered when trying to solve knotty problems of this kind. When melanism first appeared in the species I am unable to say, but when I first noticed it, seven or eight years ago, while walking upon the commons after a very heavy rain storm, I found hundreds of the species drowned in the ditches, with many black forms amongst them, and, since then, have obtained it every year, with more or less success. From the above facts it is very evident that melanism is well established on the Dearne watershed, also, I believe, in the Meltham valley, and probably also in many other districts in southwest Yorkshire, but it would be interesting to know how far this tendency at present extends, and then watch its development in districts where at present it is not in evidence.

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* Surely not in all cases. It is possible that in cases such as that mentioned the melanism is as old as the hills and their present meteorological conditions. See *Melanism and Melanochroism in British Lepidoptera*, pp. 19-21; 23-24, etc.—Ed.

Melanism in Lepidoptera.

By J. W. TUTT.

I have read with great interest Mr. Morley's note (*anteà*) on the melanism of *Larentia multistrigaria*, and quite agree with him that further detailed knowledge is very desirable as to its distribution, its spread, and the possible period of its existence. A careful perusal of his paper, and one's knowledge of the district, and what has been recently written as to its increase in recent years in certain districts, leads one to the following conclusions:—(1) That on the exposed bleak hilltops, where the species rests on "the cold, damp, black clay"—for one must assume it rested on the ground, ere humans built stone walls, and rests there now for that matter, although better seen on the walls—the melanism is of great antiquity, and of the same kind as that occurring locally in various species—*Cinophos obscurata*, *Xylophasia monoglypha*, etc., and dealt with at length in *Melanism and Melanochroism in British Lepidoptera*, pp. 19-21, etc. In such places, at any rate, a strong tendency to melanism is within the ordinary variational limits of the species. That specimens, having this tendency strongly developed, spread considerably into the surrounding areas and cross with those in which it is less marked, our knowledge of the liability to distribution in certain species, leads us to assume, and one may suppose that the inherent melanic tendency, rarely exhibited, probably, in some districts, exists throughout the whole area referred to by Mr. Morley. On the other hand, in such districts as those mentioned recently by Mr. Porritt, in the neighbourhood of Crosland, Meltham, etc., where the melanism has rapidly increased of late years, and is still increasing, one might suspect that an entirely different set of varying environmental influences have set free the latent possibilities within the species, and produced melanism of an entirely different kind, *viz.*, the melanism exhibited by *Amphidasys betularia*, *Tephrosia crepuscularia* (*bistortata*), and other species, that we have dealt with at great length in *Melanism and Melanochroism*, etc., pp. 12 *et seq.* In our opinion, an exactly similar double parallel exists in the variations of *Boarmia repandata*, where, however, one form of the species is frequently not melanic, *i.e.*, one form is old, due to the natural environment of a rock-resting habit, the other comparatively new, due to the changed local conditions brought to bear on a wall- and trunk-resting habit, during the last half or three-quarters of a century.

Pupal Skin of Chrysophanus phlaeas (*with plate*).

By Dr. T. A. CHAPMAN.

After examining the remarkable sculpturing and structure of the pupal skin of *Thecla ballus*, which is not more remarkable or complicated than that of many other pupæ, but is of quite a special character amongst the few pupal skins I have carefully examined in the same way, it occurred to me that some other Lycænid pupa would also prove to be an interesting object. The first one I took in hand was that of *Chrysophanus phlaeas*, and this one is, if anything, more unusual in its character than that of *T. ballus*.

In *Thecla ballus* everything appears solid, but there is a peculiar and complex structure of what are either hair-bases or skin-points, in

their essential nature, and these are connected together by fine ridges. The annexed photographs (by F. N. Clark, Esq.) of a portion of the dorsum of a pupa of *Chrysophanus phlaeas*, shows also a number of points connected together by fine ridges; the points are, however, much further apart, and the ridges consequently longer and also narrower. The points, however, instead of being of fairly uniform size and structure, are of two kinds, very distinct in their nature and structure, and yet perhaps identical, in that certain intermediates exist. Those that are most definitely "points" are very much smaller than those of *T. ballus*, perhaps $\frac{1}{8}$th or $\frac{1}{7}$th of them in diameter. Of some the structure is not very evident, but of most of them it seems to be very parallel to those of *T. ballus*, *viz.*, a raised thick ring, with a central object that is hardly part of the ring, but set within it. The ring is very smooth in outline, both inside and out, and the inner little knob is separated from it by a paler ring, that looks very similar to the membrane or articulation of a hair. The little knob seems of simple structure, and without any of the stellate form of those in *T. ballus*.

The other form of "points" are veritable hairs, *i.e.*, they have definite circular bases, just like those of ordinary hairs, and, centrally, is articulated a movable structure that can only be morphologically a hair. These hairs are, however, of very elaborate structure, they are hollow, and expand at the tops, so as to be trumpet-shaped, the bell of the trumpet being large, wide, and expanded, or they may be likened in form to the well-known fungus, the chantarelle. The margins of the bell, however, are not smooth, but cut up into quite a *cheraux-de-frise* of spikelets, and, in some specimens, can be made out an inner circlet of similar needle-points a little way within the bell. One or two specimens suggested that these inner spikes were on a separate membrane, that, when the specimen was fresh formed, a dome-shaped cover to the open mouth of the trumpet.

One can hardly help theorising that the first class of points are really hairs like the second, in an abortive or undeveloped state, and, on comparing, critically, these structures with those of *T. ballus*, the stars on that pupa would seem to be similar, morphologically, to the hairs of *C. phlaeas*, but reduced like those of the first kind of points on *C. phlaeas*, to a mere base, but still preserving in their stellate form the fringed and spiculate idea involved in the trumpet of *C. phlaeas*.

The plate vi shows on fig. 1 a portion of dorsum of an abdominal segment of the pupa of *C. phlaeas* (×120), with skin-points connected by ridges, or walls. The skin-points easily recognised are:—(1) Small ones with a circle and small dark centre; (2) similar, but smaller and ill-developed; (3) large circles with pale centres, in these, the hairs have been broken off, but otherwise they are the same as (4) ring bases with trumpet-hairs. Plate vi., fig. 2, a small portion of pupal skin, more magnified (×200), showing more clearly the structure of each of these skin-points.

I find that hairs of a similar general character to those of *C. phlaeas* exist on other pupæ, and hope to illustrate these later, beginning, if possible, with those of *C. dispar*. One does not altogether wonder at some of these curious hairs having been broken off, rather it is matter of surprise that they are not more largely rubbed off, if only in handling the pupæ to make the observations.

Lepidoptera and Coleoptera of the Saas Valley—Stalden to Saas-Grund.

By J. W. TUTT, F.E.S.

I had been recuperating for nearly a fortnight at Basle and Geneva before I moved on, on August 4th, 1904, to Visp, and so up to Stalden. During that fortnight the weather had been delightfully fine and hot—weather specially provided for lepidopterists as a foretaste of heaven. For the first time for 8 months I had, during the last few days, felt alive again, and, by the time I set out to walk the 11 or 12 uphill miles from Stalden to Saas-Grund, on August 5th, I had recovered my wonted vigour. Entomologically, I thought my luck was in. The morning broke cloudless, and an early start caused me to miss many of the butterflies just beyond Stalden, for the sun had not yet entered that part of the valley, but large (and somewhat worn) *Polyommatus damon*, fine *P. corydon*, *Anthrocera carniolica* were still asleep on the grass, and when the sun did get into the valley, somewhere between 8.30 and 9 a.m., one was kept busy enough. One of the first insects to put in an appearance among the fruit-trees a mile or two up the valley was *Papilio podalirius*, soon afterwards followed by *Euvanessa antiopa*, and then by *Papilio machaon*, and *Colias hyale*. The two first named of these, however, appeared to be confined to the neighbourhood of the fruit gardens in the earlier part of our walk. *Chrysophanus virgaureae*, *Epinephele lycaon*, and *Erebia goante* are, perhaps, the species of the valley, the males of the former were going over, but the ♀s were in great force. They assumed very marked forms: (1) fairly bright, the bronzy tint fairly well-developed on fore- and hindwings, but paler than in type—var. *zermattensis*, the same, but the forewings of the upperside with the markings developed into little streaks, and with minute extra spots between the discoidal spot and elbowed line—ab. *excessa*, the spots further developing in some examples, [illegible] of fengish, transverse streaks, replacing the elbowed line—ab. *incolata*, the same bronzy form, but rather more suffused, with [illegible] whitish or whitish-blue spots parallel with the hind margin of hindwings—ab. *pallidapunctata*; a suffused form, the ground colour of the forewings nearly lost in the suffusion of black scales, the hindwings still more suffused, the black spots in elbowed line of forewings often somewhat enlarged and elongate—ab. *suffusa*.

Another species in great force was *Epinephele lycaon*, the males of which [illegible] *pallidapunctata*, but the females in very great numbers and in [illegible]. These varied not only in the tint of the pale patches, but [illegible] and number of the spots, and in the area occupied by the pale [illegible] on both fore- and hindwings. The most marked forms [illegible] (1) The pale areas orange-brown, with a distinct [illegible] dividing basal from outer areas: (a) with two [illegible] in outer area, one apical and one lower—typical [illegible] with a double apical spot and one below—ab. *duplicata*, (c) [illegible] upper and lower, and one tiny, intermediate, black [illegible] with two very large normal, and one intermediate [illegible] spots—ab. *magna*. (2) The pale areas orange-brown with [illegible] almost obsolete: (a) the hindwings with [illegible] ab. *obsoleta*, (b) the hindwings with distinct, pale, median area—ab. *extensa*. (3) The pale areas paler, yellowish,

(*a*) with two moderate-sized normal spots and distinct angulated line = ab. *pallida* ; (*b*) with three spots, two ordinary and one intermediate = *trimacula-pallida* ; (*c*) the angulated line almost obsolete, the pale area being continuous, and pale median area on hindwings = ab. *obsoleta-pallida*. Besides these there is an intermediate ♀ form, in which the outer part of the pale area is lighter than the basal. These may have the ordinary two spots = ab. *intermedia*, or three spots = *trimacula-intermedia*.

From Resti to Zenschmieden, three interesting species attracted attention, *viz.*, *Hipparchia alcyone*, *Hipparchia semele*, and *Satyrus cordula*. The last-named was going over, and only three females worth setting fell to the net. The variation in these three examples is very remarkable (1) small, with four, well-marked, pupilled spots on fore- and well-developed one on hindwing, the pale bands being well marked. Another is large, with the two central spots on forewings small, and the pale band on forewings almost, those on hindwings quite, obsolete. The third example is intermediate in size, with two spots only on forewings, the others marked only by white points and the anal angle of hindwings also almost obsolete.

Those lepidopterists who want to record *Satyrus actaea* from Switzerland must get the real thing. I quite agree with those lepidopterists who assert that the southern *actaea* is a species quite distinct from *cordula*. It is an insect much nearer to *statilinus* in shape of wings, etc., than to *cordula*. My judgment is based largely on Spanish *actaea*. The ♀ s are very specialised. *H. semele* was remarkable for the richness of the colour of the orange-brown patches of the ♀ , two examples from Fontainebleau being the only ones in my long series approaching these in depth of colour, the undersides are equally richly coloured. This form is surely not *aristaeus*, which is the local form from the Mediterranean Islands. Of *H. alcyone* I ought to have taken a long series, but the species is not always easy to take, and uphill miles being long, one must not hang fire too long on the road, otherwise the species had evidently not long been out, and possibly 50 per cent. of those netted were worth keeping.

There is an old Kentish proverb that "the older one gets the bigger fool one becomes," which I presume is meant to suggest that the older you become the more information you get and the less cocksure of things in particular you become. This is certainly my position with regard to the *athalia* group of Melitæas, of which I now begin to fancy I recognise a lowland (and woodland) form of *Melitaea athalia* and a hill or mountain form, the former, as I know it, occurring in the woods of central Europe, and the latter, the Alpine lowlands from about 1500 or 2000 to almost 4500 feet elevation. This latter form was found here and there between Stalden and Hüteck in single specimens, very worn, only four examples (and these none too good) being considered worthy of pinning for reference; a single specimen of *M. dictynna* was also taken.

What a glorious valley this would be for those collectors who love year after year to go to the New Forest to capture *Dryas paphia*. Here it is in hundreds, whilst *valesina* is also abundant, and *Argynnis niobe*, *A. aglaia*, *A. adippe* and *A. lathonia* are almost as frequent, and, for a change, a very fine race of *Parnassius apollo*. Our box was so full of other fry that we were obliged to consign our samples of these larger species to the lining of our hats, a proceeding that does not, as a rule,

enhance their beauty if the mopping of one's face necessitates the hat being pushed back or being removed very often. One of the ♀ s of *P. apollo*, captured at Hüteck, has the large central spot of hindwings entirely red (ab. *rufa*) without a white centre. I took a similar fine ♀ at Bourg St. Maurice, at the end of July, 1898; also ♂ and ♀ at Courmayeur, August, 1898; ♂ at Simplon, at the end of July 1899, etc., but it is a distinctly rare form in my experience.

In the lower part of the valley I was glad to see *Gonepteryx rhamni* flying, and, all the way up to Hüteck, *Leptosia sinapis* was common, the ♀ s with very little apical marking. *Melanargia galathea* was everywhere abundant but worn to shreds, and, with the exception of a few worn *Erebia aethiops* in one or two spots, the only *Erebia* of this part of the valley was *Erebia goante*. This species was in the greatest abundance, ♀ s being not at all infrequent. Few *Pararge maera* were up to setting standard, and a single ♀ *Melitaea didyma* with rather dark forewings, taken just above Hüteck, was netted. Worn *Chrysophanus* var. *gordius* were not uncommon, one ♂ having the middle apical spots of the forewing united. A solitary *Chrysophanus phlaeas*, moderately dark, was the only one seen, and only one *Thecla spini* was worth taking. *Syrichthus alveus* was abundant enough, and *S. sao*, *Pamphila sylvanus* and *Thymelicus thaumas* were captured. *Polyommatus corydon*, *P. icarus*, *P. hylas*, *P. astrarche*, *P. eumedon*, and *P. donzelii* were the only Lycænids observed, while among the Anthrocerids, *Anthrocera purpuralis*, *A. transalpina*, *A. filipendulae*, *A. lonicerae*, and *A. carniolica* were taken, *A. lonicerae* though was getting into very bad condition. The only other moths netted were *Minoa euphorbiata*, *Syntomis phegea*, and *Ennychia cingulata*.

Just after we had passed Hüteck the clouds collected over the valley, and, rapidly as they can gather in the Alps, they soon shut out the sun, and within half-an-hour a storm set in that did not clear until Saas-Grund was reached. On my arrival there, however, I found Mr. Morel, a well-known French coleopterist, who had been collecting coleoptera and lepidoptera for some six weeks in the valley.

As it was so wet on my journey up from Hüteck to Saas-Grund, I went for a walk down the valley as far as the bridge above Hüteck on two occasions, August 7th and 9th, but the season was evidently over, and, in many respects, I was wofully disappointed, although I obtained many insects that were of use to me. Still the Erebias of the valley were over and I set free six to every one I retained as being worth setting. The only exception was *E. goante*, which was in the greatest abundance and finest condition. *Issoria lathonia* was again still abundant and just coming out, also *Epinephele lycaon*, of which occasional ♀ s with the whole central area of the forewings of quite a yellow tint (= ab. *pallida*), were the only ones I felt called upon to capture. A single fine small *Erebia euryale* was taken on each occasion, the species had been over a good fortnight Mr. Morel said, whilst a few *Erebia tyndarus* were netted, and, in one corner, where *E. melampus* was not yet altogether done with, I took a few specimens as examples of the district. *Polyommatus donzelii* males, were at the runnels on August 7th, with *Polyommatus astrarche*, *P. icarus*, *P. corydon* and *Lusticus argus* (*argyrognomon*), and I took four very good specimens of the first named, and several of the others, all being in good condition, whilst one slightly worn *P. eros* ♂ was rather in the nature of a surprise. Here, too, *Syrichthus alveus* and

Pamphila comma were not uncommon, and I obtained also two or three specimens each of *Thymelicus thaumas* of fair size, and a few very small *T. lineola*, but most of these species were worn to rags. On the 9th, I caught a specimen of *Cupido minima*, and, although I saw no males of *P. donzelii*, on this occasion, I caught two or three ♀s on a bank skipping over the flowers, and one of them was in really fair condition. This was the first I had seen since I took two ♀s at Larche, in 1900, the only ones I had before captured. *Chrysophanus* var. *gordius* was evidently over, but *C. virgaureae* was still in the greatest abundance, and the ♀s of the *zermattensis* form were most interesting, and I got one of the finest series on the 9th that I have ever taken of any butterfly. Many of the ♂s are of the *miegii* type, with the discoidal mark of the forewing outlined in black, but certainly not so distinctly as in those that Dr. Chapman brought from Moncayo, Spain, in 1903. Of the lovely series of ♀s, with their differences in shade of ground colour, the varying amount of suffusion, the streaked spots on upper side of forewings, and highly developed row of white or bluish-white spots on hindwings, a separate descriptive and illustrated paper is needed, but they pleased me much, and even now that the newness of the feeling of possession has worn off, I think they are especially interesting. Plenty of *Parnassius apollo*, and a few still fine *Argynnis adippe* ♀s, here and there fine fresh *Leptosia sinapis*, in one place *Hipparchia semele*, and a ♂ of *Pieris napi*, as white as snow, toying with a fine ♀ *bryoniae*, added variety to the catch, and, if I got nothing rare on these occasions, at least I got a number of interesting specimens. Among the moths were *Agrotis tritici*, *Charaeas graminis*, *Gnophos dilucidaria* (?), *Cidaria immanata*, *Stenoptilia pterodactyla* (*fuscus*), *Cidaria populata*, and a few others not to be named offhand; but the Anthrocerids were over, and an occasional worn large *A. lonicerae*, *A. achilleae*, and *A. ochsenheimeri*, were left as ghostly remnants of the lovely army that M. Morel told me had a month before brightened the pathsides of the valley. On August 12th I left Saas-Grund for Stalden, and what a lovely day it was. *Chrysophanus virgaureae* still in its amazing abundance but getting passé now, and, in addition, to all the species already noted, a few additions were made, *Argynnis aglaia*, another single *Melitaea dictynna*, and a dark ♀ *M. didyma*, several *Polygonia c-album*, *Syrichthus sao*, and here and there a specimen of *Pararge maera* and *P. megaera* not quite so bad as its neighbours; I also took more *P. donzelii* ♀s, and *Cupido minima*. A few fine fresh *Anthrocera transalpina*, hitherto the examples had been too worn to notice, and strangely two fine *Melanargia galatea*, all examples of which hitherto seen down the valley had been far too bad to keep, a single *Syntomis phegea* which had been abundant in early July, whilst examples of *Lithosia lutarella* rather of the lower than the higher form, *L. caniola* (yellowish form), *Platyptilia gonodactyla*, and *Boarmia repandata*, were picked up as samples by the way. At Balen, the pupæ of *Pieris brassicae* were in great abundance under the fences, and lower down the valley, between Hüteck and Stalden, three ♀s of *Pieris* var. *bryoniae*, in one little field, fell to the net. Then *Pontia daplidice*, *Gonepteryx rhamni* began to appear. Near the house, where the mulberries grow so deliciously, *Euranessa antiopa* was on the move, with some worn *Hipparchia alcyone*. To stalk the former in the afternoon sun was fine sport, and more successful than earlier in the day, when catching is out of the

question. Before I reached Stalden, however, the sun had left the valley, and, as I had my boxes full, if not of rarities, of useful captures, I was not altogether sorry that work for the day was done.

As I have already noted I had the good fortune to meet Mr. Morel of Paris, who, although primarily a coleopterist, was not averse to collecting lepidoptera for certain correspondents in various parts of Europe, who sent him coleoptera in exchange. He kindly allowed me to look through his boxes, and the views formed first hand underwent, in many cases, very rapid modification. Arriving at Saas-Grund, on June 26th, the insects taken during the early part of his stay included *Erebia ceto* (in abundance), *E. melampus*, *E. euryale* (very abundant), *Melitaea phoebe*, *M. athalia*, *M. dictynna*, *Polygonia c-album*, *Coenonympha* var. *darwiniana*, *Urbanus* (*Carcharodus*) *lavateraeae*, *Melampias epiphron* (evidently down from a higher elevation on one side of the valley), *Pamphila sylvanus*, *Nisoniades tages*, *Chrysophanus* var. *eurybia*, *Enodia hyperanthus*, *Eugonia polychloros*, *Satyrus alcyone*, *Brenthis amathusia*, *B. pales*, also evidently a high species, although *Colias phicomone* was not at all uncommon in the valley above Saas-Grund. Of the moths, which one does not feel so competent to name offhand, *Eubolia mensuraria*, *Acidalia holosericata*, *Endrosa* (*Setina*) *aurita* (spotted form), (and, below the Hinteck Inn, *Syntomis phegea*), *Cleogene lutearia*, *Lasiocampa quercus*, *Melanthia montanata*, *Acidalia dilutaria*, *Adscita geryon*, *Anthrocera achilleae*, *Acidalia immorata*, *Euclidia glyphica*, *Agrotis alpina* (small dark species), &c.

At the end of the first week of July other insects became abundant, and one notices particularly *Anthrocera lonicerae*, *A. ochsenheimeri*, *A. achilleae*, and *A. transalpina*, whilst *Melampias melampus* had become very common, and *Erebia ceto* and *E. euryale* were going over. *Brenthis amathusia*, *Melitaea athalia*, *Coenonympha* var. *darwiniana*, *Chrysophanus eurybia*, and *Colias phicomone* still appear frequently, whilst *Argynnis niobe*, *A. adiaia*, *Chrysophanus virgaureae* var. *zermattensis*, and *Thecla spini* began to appear, as also did *Polyommatus hylas*, *Pamphila comma*, *Polyommatus corydon*, and *Erebia goante*. *Melitaea dictynna* was by this time worn, and *Parnassius apollo* and an odd *P. delius* were both captured, a very low elevation for the latter. It is remarkable that the *E. aurita* now caught were all of streaked, and not spotted, forms. *Tanaona chaerophyllata* in fine condition, and *Cinophos glaucinaria* (?). The large *Xylophasia lateritia*, a single *Lithosia lutarella* (*pygmaea*), and a single *Setina irrorella*. *Thymelicus lineola* began also to appear, and *Cleogene lutearia*, which Mr. Morel says is common, appears to have become very abundant. Towards the end of July many species were evidently over, whilst *Parnassius apollo*, *Epinephele ignota*, *Erebia goante*, and streaked *Endrosa aurita* had become quite abundant. *Erebia tyndarus* also appeared, *Chrysophanus virgaureae* remained very abundant, *C.* var. *gordius* (very rare), *Brenthis amathusia* is going over, *Issoria lathonia* appearing, whilst the quite dark ♀ of *Chrysophanus* var. *eurybia* was taken. *Polygonia c-album*, *Argynnis aglaia*, *Anthrocera lonicerae* var. *magna*, and *Anthrocera ochsenheimeri*, were abundant, and *Syrichthus alveus* commenced to appear. Among other species captured at this time were *Leptosia sinapis*, *Aporia crataegi* (flew into the hotel), *Vanessa io*, *Cidaria popularia*, *Eubolia bipunctaria* (common), and *Arctia caja* (at light). *Pamphila comma* appears to have been very common. Up to the end of July

the same species occurred in greater numbers, a few *C.* var. *gordius* being the most noteworthy. *Papilio machaon* and a fair number of *Colias phicomone* were taken. On July 27th, Mr. Morel went to Mattmark and stayed for six days. Here he found butterflies very scarce. A fair number of *Parnassius delius* was taken, the species being rare this year, *Brenthis pales*, *Colias phicomone*, a single *Coenonympha* var. *darwiniana*, and a single *Erebia mnestra*, *Erebia tyndarus*, *Pamphila comma*, and *Hesperia alveus* appear to be the only other butterflies captured. *Pygmaena fusca* was especially abundant, and, among the coleoptera, *Cicindela gallica* was in magnificent variety and also abundant.

The most interesting captures among the coleoptera between June 26th and mid-August, in 1904, in the Saas valley, are *Oxypoda soror*, Thoms., which is not very common, *Otiorrhynchus subcostatus*, which is fairly abundant, and a species, which appears to be *Anthobium impressicolle*, very abundant here, although only given by Reitter from the Pyrenees, of which one would like more information. *Quedius dubius* var. *flavolineatus*, Bech., very rare here, and possibly a new *Atomaria*, and a very rare *Liodes*. *Chrysobothrys chrysostigma* is a good species occurring here, but is more common in the Tyrol. *Hippuriphila nigritula*, Duft, is also common, and *Crepidodera peirolerii* vars. *superba* and *moesta* both occur here very abundantly and are to be obtained by sweeping. *Apion spencei* is also a pretty common species here, and *Anthophagus bicornis*, *alpinus*, *fallax*, *alpestris*, and *praeustus* are perhaps worthy of mention, the first-named being the most abundant, followed by *alpinus* and *alpestris*; *praeustus*, possibly the best of these species, is not common. It is perhaps to be remarked that *Attelabus coryli* is very common at Hüteck, but that not a single example has been taken in the Saas valley above this point, explained easily because *Corylus* does not occur above this, although the species also feeds on *Alnus*, yet does not seem to follow this plant up the valley; *Melasoma aenea* also occurs with this species. *Orina gloriosa* var. *excellens* and var. *venusta* both occur commonly here. *Zonabris flexuosa* (? or *geminata*) is fairly abundant, and *Adorus obscurus*, common at Loeche, reaches up the valley as far as Saas-Grund. *Barynotus margaritaceus*, formerly in great abundance in one meadow in Saas-Grund, has been very rare this year (1904), and it is to be noted that last year not a single specimen was obtained, the season being a very bad one for all beetles in the valley. *Hydroporus borealis* is very abundant in the river-water where pools are made.

Synopsis of the Orthoptera of Western Europe.

By MALCOLM BURR, B.A., F.L.S., F.Z.S., F.E.S.

(*Continued from* p. 156.)

Genus XV: Epacromia, Fischer.

In the construction of the elytra this genus is a transition to the *Œdipodidae*, but in the structure of the head agrees with the *Truxalidae*. The elytra are alike in the two sexes, with the mediastinal area dilated at base, the scapular area very narrow, irregularly reticulated, the discoidal area with a vena intercalata; wings subhyaline, often tinted with yellowish-green. The distinction of the species is rather difficult.

TABLE OF SPECIES.

1. Infraanal plate of ♂ depressed.
   2. Elytra as large as abdomen, or scarcely longer; with big greyish spots; infraanal plate ♂ with lateral margins parallel, and apex broadly rounded; tibiæ reddish .. .. 1. PLATYPYGIA, Pantel.
   2.2. Elytra distinctly longer than abdomen, of almost uniform colour; infraanal plate ♂ broadened towards apex and truncated there .. .. 2. TERGESTINA, Muhlf.
1.1. Infraanal plate ♂ conical, of ordinary form.
   2. Hinder femora narrow, with the black spot of inner face interrupted near base; wings nearly hyaline; form slender .. .. 3. THALASSINA, Fabr.
   2.2. Femora stouter; black spot on inner face not interrupted; wings darkened towards apex; form stouter .. .. 4. STREPENS, Latr.

1. EPACROMIA PLATYPYGIA, Pantel.

A rare Spanish species characterised by the depressed infraanal plate of the ♂, in which it resembles *E. tergestina*, but it differs from that species in the shorter elytra, with large greyish spots; the infraanal plate is also somewhat differently shaped. Length of body, 22mm.-28mm. ♂, 25·2mm.-32mm. ♀; of pronotum, 3mm.-4mm. ♂, 4·6mm.-5·2mm. ♀; of elytra, 15·5mm.-18·5mm. ♂, 20mm.-24mm. ♀. Recorded from Uclés and Salamanca.

2. EPACROMIA TERGESTINA, Mühlfeld.

Distinguished from the two following species by the grey or brownish colour, depressed infraanal plate of ♂, the triangular foveolæ of vertex, the unspotted elytra. The inner side of the hinder femora is never red; the size is very variable. Length of body 14mm.-25mm. ♂, 22mm.-32mm. ♀; of pronotum, 3mm.-4·7mm. ♂, 4·3mm.-6mm. ♀; of elytra, 15mm.-23mm. ♂, 21mm.-30mm. ♀.

A species of wide, but erratic, distribution. It occurs in salt-marshes; in France, it is recorded from Arcachon, La Teste-de-Buch, Lamothe; Charpentier notes it from Switzerland, with no precise information. It it recorded from Domleschg and at Siders in Valais; it is known at Wattens near Innsbrück, and, in Spain, at Santander and San Vicente de la Barquera.

3. EPACROMIA THALASSINA, Fabricius.

Green, with dark spots; elytra with dark spots, the scapular and mediastinal areas bright reddish-brown from the base to the middle; wings hyaline, with a greenish-yellow tinge near the base, slightly smoky towards the apex; hinder femora slender, often green, the under keel never punctulate, the inner face bright purple, with the base spot interrupted, so that apparently there are three spots, the underside yellowish. Length of body, 17mm. ♂, 22mm.-25mm. ♀; of pronotum, 3·5mm. ♂, 4mm.-4·8mm. ♀; of elytra, 16mm.-18mm. ♂, 20mm.-25mm. ♀.

Common in dry sunny places in southern and south central Europe; in France, it occurs as far north as Fontainebleau, also at Agen, Aix, Toulon, Auges, Nice, Draguignan, common throughout Provence, occurs even in winter at Arcachon, Saumur, le Blanc, Tarbes, Allier and near Lyon. In Germany at Karlsruhe and Glogau. In Switzerland at Geneva; in Austria, rare: Brigittenau, Prater, Neusiedlersee, Ober-

weiden; in Italy, very common in the north in the summer: also throughout the Iberian Peninsula. It is found late into the winter, and perhaps hibernates.

4. EPACROMIA STREPENS, Latreille.

Stouter than the preceding, and generally darker in colour; the hind femora are especially thicker and shorter. The green colour is less frequent in this species than in *E. thalassina*, and brown is commoner. Length of body, 18mm.-20mm. ♂, 22mm.-28mm. ♀; of pronotum, 4mm. ♂, 4·5mm.-5·6mm. ♀; of elytra, 18mm.-19mm. ♂, 20mm.-26mm. ♀.

Abundant in sunny places in southern Europe; commoner than the preceding, but does not occur so far north. In France it has not been recorded farther north than Bordeaux and Montelimar. It is common all the year round in all Spain and Portugal. It is very common in the north of Italy, and probably also in the south. It is found also in Austria and the Tirol. Rudow (*Zeitschr. für Ges. Naturw.*, xlii., p. 298, 1873) records the preceding species from the sandhills of Mecklenburg, but his description agrees better with this; if it is true, it is a remarkably northern record.

Both species take readily to flight and often fly far and long, and so are difficult to capture.

GENUS XVI: MECOSTETHUS, Fischer.

Differs from *Epacromia* in having the intercalate vein of the elytra nearer to the ulnar than to radial vein; the foveolæ of the vertex are impresso-punctate; more or less triangular. There is a single European species.

1. MECOSTETHUS GROSSUS, Linné.

Dark-olive green; elytra olive-green, with a bright yellow stripe down the mediastinal and scapular areas; wings hyaline, with darker veins, somewhat smoky towards apex; hinder tibiæ olive, yellow near the base, with black spines. Length of body, 12mm. ♂, 26mm.-30mm. ♀; of pronotum, 3·4mm.-4mm. ♂, 5mm. ♀; of elytra, 17mm.-19mm. ♂, 18mm.-24mm. ♀.

Found in watery marshes in northern Europe; Lapland; Ireland; England, in the New Forest and Fens; throughout France, though less commonly in the south. Common in Belgium; found in the northern part of Spain, in Aragon; north of Portugal, Coimbra, Oporto. It occurs as far south as the Alps, where it is found at considerable elevations, as on the Righi, where, however, it is rare. In Lapland it occurs at Qvickjock, and in Skåne. In Austria at Mödling, Prater, Marchfeld, Gmünden, Langbathseen.

(*To be continued.*)

Dinarda hagensi, Wasmann, a species of Myrmecophilous Coleoptera new to Britain.

By HORACE DONISTHORPE, F.Z.S., F.E.S.

On May 13th last I took a small *Dinarda* in a nest of the rare ant, *Formica exsecta*, at Bournemouth, which I at once recognised as new to Britain, and it turns out to be *Dinarda hagensi*, Wasmann, a species which is only found with *F. exsecta* on the continent. I may

say that I was looking for *hagensi*, as I have always said that if the nests of *exsecta* were worked for beetles in this country, that this species would occur. In 1902, I went to Bournemouth to search for this ant, and was joined by Mr. W. C. Jackson of that town, but we failed to find any nests. In 1904, Mr. Jackson sent me some ants, and said he had found a nest, so this year I determined to go down again and examine this nest. We found two nests, but only one beetle was taken, by me, out of the smaller one. *F. exsecta* makes a small nest of ling and grass, and is very scarce in this country.

When I got home I compared my beetle with a specimen of *D. hagensi*, given to me by Father Wasmann, and found that the antennæ did not agree, joints 4-10 being much shorter and broader. I, therefore, concluded that I had got a new species, and sent it on to Father Wasmann to examine. He compared it with all his Dinardas and found that it agreed with the typical specimen of *D. hagensi*, taken by Von Hagens, and described by Wasmann in *Wien. Ent. Zeit.*, 1889, p. 281. This specimen he kindly sent for me to examine. It is probable that this is the original form, and those taken by Wasmann at Linz-am-Rhine, with *F. exsecta*, and redescribed in *Deutsch. Ent. Ztschr.*, 1894, p. 275, are either another species or a more recent development. They have the antennæ longer and the sides of the elytra somewhat turned up, etc. In my specimen the elytra are much narrower than the thorax, the sides are not explanate or turned up, and the edges are serrate, which will at once separate it from our other species. It is smaller than *D. dentata*, the colour is a lighter red (more yellow), and the posterior angles of the thorax and elytra are less produced.

This is, perhaps, the most interesting discovery made as to the inhabitants of ants' nests in this country since the late E. W. Janson first took *Hetaerius sesquicornis*. We now possess three species of *Dinarda*: *Dinarda maerkeli*, only found with *Formica rufa*; *D. dentata*, found with *F. sanguinea* and *F. fusca*; and *D. hagensi*, found with *F. exsecta*.

OLEOPTERA.

GRAMOPTERA HOLOMELINA, POOL, A GOOD SPECIES. In the *Ent. Rec. and Jnl.* p. 133), Mr. Pool described a totally black form of *Grammoptera* under the above name, and pointed out that he had taken three specimens in 1904, and that a specimen just like these was taken by Mr. E. A. Waterhouse, in Yorkshire, thirty years ago. Mr. Pool has now taken some thirty more specimens from the same hawthorn edge at Enfield, and I had the pleasure of taking my series with him on one occasion last month. I consider that this form is a good species, since, in all these specimens, there is not the slightest variation, nor are there any intermediate forms. Mr. Pool has taken both ♂ and ♀, which only differ from each other in size and length of antennæ, neither showing the slightest red on antenna or legs whatever, nor the slightest pubescence such as is found on *ruficornis*; he has also taken them *in copula*. *Gr. ruficornis* is not uncommon at this hedge, and it varies considerably, but not for one minute could the true *holomelina* be mistaken for it; however slight the red may be at the base of the femora, the typical *ruficornis* pubescence will be found on the elytra, and where the pubescence is more scanty the legs have

more or less red, but in *holomelina* neither of these points are ever visible, and, moreover, the punctuation is stronger. Mr. Pool has also found the different vars. of *G. ruficornis, in cop.* together, but never *holomelina* and *ruficornis, in cop.* It has been suggested that this form is a var. of *ruficornis* (*loc. cit.*), but I think the above reasons are sufficient to separate it specifically. It has also been suggested that it is a form of *G. variegata*, Germ. (= *analis*, Pz.), but this is absurd, as not only is the latter a much larger insect, but Germar describes it as having ashy-grey pubescence, the apex of the antenna red, and the legs black in the ♂, but in part red and with the ventral segments red in the ♀. I have also heard it said that as *ruficornis* is so common, and everyone gets their series at once, they might pass this over, as they never trouble about *ruficornis* again, but no one would ever pass *holomelina* over for *ruficornis* when he saw it alive.—HORACE DONISTHORPE. *June 6th*, 1905.

COLEOPTERA IN SUSSEX.—The following note deals with a few uncommon species captured at Ditchling, Sussex, this Easter (May 24th). In the Geodephaga, the only captures worthy of note were—*Cychrus rostratus*, L., one, out of moss, making two of this species in two seasons; *Badister sodalis*, Duft., fairly common in moss, dead herbage, &c.; *Dyschirius politus*, Dj., in sandpit, parasitic on *Bledius opacus*, Block., the latter in profusion; *Stomis pumicatus*, Pz., a few at odd times, in moss, stone heaps, &c.; *Platyderus ruficollis*, Marsh., one by sweeping. No Hydradephaga of any importance put in an appearance, it being rather a poor locality for aquatic species. The Hydrophilids were represented chiefly by various members of the genus *Cercyon*, of which, perhaps, *C. unipunctatus*, L., was the most prolific of the better ones. In the "Staphs," *Aleochara cuniculorum* was very abundant in rabbit-burrows in sand-pits, perhaps the most common species in the pit. *Stilicus subtilis*, Er., again put in an appearance, in a very desultory way however; *Medon brunneus*, Er., was fairly often taken, but as a rule only singly; *Philoridum sordinum*, Steph., swarmed on the blossoms of *Ulex europaeus*, and was to be beaten in any numbers on a bright day. Of the Silphids, the only species worthy of note was one *Choleva anisotomoides*, Spence, out of moss. My best capture was in the Pselaphids, where I had the good fortune to capture one *Trichonyx märkeli*, Aub., it came from moss in a hedgerow, and though desultory ants of two or three kinds were met with, no big nest could be found. However, as, at the time of capture, the specimen had not been identified, with any certainty, energetic search for the head-quarters of the ants' nest was not made till a short time after, the ants probably having migrated in the meantime. Of the Coccinellids, *Scymnus* var. *scutellaris*, Muls., was perhaps the most interesting, four or five of which were taken in moss. The Nitidulids, though little worked, yielded a few of the local little *Pria dulcamarae*, Scop., off blossoms of *Cornus sanguinea*. By sifting haystack refuse the usual Lathridiids were obtained, and several *Cartodere ruficollis*, Marsh., were taken. *Aphodius luridus*, F., var. *elytris-niger*, was the best of the Scarabæids taken, it was in company with the type. Of the Scolytids, *Xylocleptes bispinus*, Duft., and also *Phloeophthorus rhododactylus*, Marsh., were common, the former in stems of *Clematis vitalba*, the latter in *Ulex europaeus*. The above list represents the species I have yet had time to work out, and my very best thanks are due to Mr.

H. St. J. K. Donisthorpe, for his kind help in verifying, and in some cases identifying, my records. HEREWARD DOLLMAN, 14, Newton Grove, Bedford Park, W. *May 19th*, 1905.

CRYPTOCEPHALUS BIPUNCTATUS, L., VAR. THOMSONI, WEISE, IN SUSSEX. I have a couple of this rare *Cryptocephalus*, taken by myself in Sussex, in 1903. Owing to the difficulty in their identification, &c., I have not been able to record them before, but, by the kindness of Mr. Donisthorpe in identifying them, am able to do so now. HEREWARD DOLLMAN. *May 19th*, 1905.

SCIENTIFIC COLEOPTEROLOGY. AUTHENTICATED "TYPES" – WHAT ARE THEY? I should like to offer a word of criticism of one of the methods followed by many coleopterists in this country in naming their specimens. It does not seem to be by the sound scientific method of original research of comparison with the details of the original description (and the original specimen if in existence), but by the obtaining of a so-called "authenticated type" from some European coleopterist of repute, with which comparison is made and conclusions arrived at. This may be satisfactory up to a point, but to call such a specimen a "type," appears to be as unsound scientifically as it is possible to imagine anything, leads to all sorts of errors, to a continuation of blunders when made, and tends to make our British coleopterists utterly dependent on continental "opinion," rather than "fact," and further it does away with original investigation. There can be no such thing as an "authenticated type" except from the author of the name, and the "types" of any other man are an anachronism. Surely British coleopterists are as capable of dealing with original descriptions and specimens as continental coleopterists. Specimens of a species from any known coleopterist are useful for comparison, and as illustrating the particular collector's view of the species, but have no other value, and, as for their being "authenticated types," the thing is, in ordinary parlance, absurd. I may add that this is merely a personal opinion, written without the knowledge of, or consideration of, the feelings of my editorial colleagues on this subject. It strikes me as so utterly ridiculous that I should write to a continental lepidopterist for a specimen of some little known species, and accept it as a "type" of the species, possibly without question, and probably without comparing it with the original description, if I want it for a really scientific purpose. J. W. TUTT.

SCIENTIFIC NOTES AND OBSERVATIONS.

ON THE SWIMMING POWERS OF THE LARVA OF ARCTIA CAJA, L. – Having several larvæ of *Arctia caja* on hand, and, feeling that as these larvæ are often to be found on various low plants at the sides of ditches, some probably at times fall, or are knocked, into the water, I made several experiments with some of my larvæ, with a view of ascertaining to what degree (if any) the power of swimming was developed in these larvæ. I first placed several nearly full-grown larvæ into a trough of water, which larvæ immediately curled themselves up (if not already curled up), and floated on the top of the water in this position, seemingly sustained by their hairs. After an interval, varying from about one minute to about a quarter of an hour, the *larvæ* uncurled themselves and attempted to move along the surface of

the water, not on their backs, like *Eumorpha elpenor*, L., was observed to do by Albin, Hellins, and Harris,* but "right way up." Some of the larvæ, after having uncurled themselves, at first moved the head and tail to and fro, and, in this respect, more or less agreed with what Hellins suggested *E. elpenor* might do.* This mode of progression, however, is extremely slow and uncertain, and, in all cases, was given up by the larvæ after a short time, but was, however, in some cases, resorted to again, on and off, for a few seconds each time. The rest of the larvæ, as soon as they were uncurled, tried to "walk" on the surface of the water, and with fair success, as, on an average, they progressed about an inch a minute. The larvæ which first moved the head and tail to and fro, afterwards followed the example of the rest, and tried to "walk" on the surface of the water. The larvæ, when "walking" on the water, progress in rather a jerky manner, and a slight arch of the body commences at the posterior and runs along the body to the head, it being most pronounced when at the 1st and 2nd abdominal segments. If the larvæ are first completely immersed in the water (which can only be done by holding them under the water) they seem to be only able to get their heads and thoracic segments out of the water until they reach dry land; in this case, they progress by moving the head to and fro, the rate of progression now being, if anything, slightly quicker than in the former case. In one instance, I dropped a larva into water from a height of about ten feet, and it did not sink, the hairs apparently being sufficient to keep the larva from sinking, or becoming totally immersed in the water. I also placed some larvæ in water to see how long they could live in such a position, keeping them in, or rather on, the water for periods of five, ten, fifteen, thirty, and forty-five minutes, and two and ten hours; in each case when the larva was removed from the water it appeared to be none the worse for its swim. Taking the above facts into consideration, it seems that if a larva of *A. caia* happens to fall into water (even from a height of ten feet, or perhaps more) it is not likely it would be drowned, as it is able to remain on the surface of the water for a considerable period, perhaps as long as it could live without food, and has, moreover, the power of swimming of no mean order.—RALEIGH S. SMALLMAN, Wressil Lodge, Wimbledon Common, Surrey. *May 16th*, 1905.

NOTES ON LIFE-HISTORIES, LARVÆ, &c.

PUPAL HABIT OF MACROTHYLACIA RUBI.—I am much interested in watching a pupa of *Macrothylacia rubi*. The larva spun up in a chip box, and made a slight silken cocoon, the top of which was left open for emergence. Every morning, the pupa wriggles its way to this opening, and all day it remains with its head slightly projected from the cocoon, but, at night, when the temperature falls, the pupa drops back into the bottom of the cocoon. I mention this as I have seen no notice of this curious habit elsewhere.—PERCY C. REID, F.E.S., Feering Bury, Kelvedon. *May 1st*, 1905. See *Nat. History British Lepidoptera*, iii., p. 141.—ED.]

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* See *A Natural History of British Lepidoptera*, by J. W. Tutt, vol. iv., pp. 67-68.

FOODPLANTS OF BOARMIA ABIETARIA.—I am rearing some larvæ of *Boarmia abietaria*, beaten from whitethorn and blackthorn in the New Forest. Are these foodplants generally known in the wild state? I see no mention of them in Barrett's *Lepidoptera of the British Islands*. —IBID.

EGGS OF LEPIDOPTERA.—*Polyommatus baton*.—The egg fairly large for size of butterfly, of a bright green colour and somewhat shiny when laid, in shape a very flattened depressed spheroid, the height not more than half the diameter. The surface (under a hand-lens) appears to be covered with numberless little points, but, no doubt, under a higher power, would show considerable detail. The micropylar point is small, dark green and hence very conspicuous. [Described with a hand-lens April 28th, 1905, dissected from a ♀ taken at Hyères.]

Libythea celtis.—A tall upright egg, oval in outline. Height : diameter : : 5 : 3, slightly flattened at the apical area, where the longitudinal ribs form a prominent projecting rim on the edge before falling over into the depression; colour of a pale pearl-white with the faintest yellowish tinge, surface shiny. The longitudinal ribs very numerous, fine, but well marked (apparently about 32-36.) The egg is also finely and closely ribbed transversely. (I could make out no other structure with power at disposal.) Egg dissected from female at Draguignan. May 5th, 1905.

Acidalia virgularia (?).—Very small, tending to cylindrical in outline; length scarcely more than breadth; one end (micropylar) flatter and wider than its nadir. Laid as a flat egg, upper surface scarcely depressed, the egg being full and swollen. The surface minutely and regularly pitted longitudinally, giving the surface the appearance of having a texture of woven silk; colour, pearly-whitish, rapidly changing to buff with irregular streaks of crimson as the embryo matures (giving the eggs the appearance of being red to the naked eye). ? of what appears to be this species taken at La Garde near Toulon. Eggs laid May 1st, 1905; described May 5th, 1905, with a hand-lens. Hatched May 13th-14th. J. W. TUTT.

THE EGG AND NEWLY-HATCHED LARVA OF EPINEPHELE IDA.—OVUM (Examined two, laid July 30th, 1904, same day.): Colour, pale yellow, but deepening in a short time. Although in the larval, pupal, and imaginal states this species is apparently nearly allied to *Epinephele pasiphae*, yet, in the egg, it differs greatly. The eggs are laid on exposed roots, dead leaves, or bits of bark on the ground near the grass tuft, and, unlike the eggs of *E. pasiphae*, they are fixed to the object, and do not roll about loosely. Height, ·6mm., greatest breadth (at base), ·55mm. The egg is broadest at base and tapers to the edge of the flat area on top. It is, in fact, a truncated cone, the top being sheed off very abruptly. One examined had 12, another 13, rather high vertical ridges running up from the base, and continued over the edge of the top through a *very* shallow circular depression or "moat," and ending at the outer edge of a central rosette of well-defined thin walled cells, the whole slightly raised. The "moat" around the rosette is covered with *very* shallow cells, and the sides of the egg are transversely ribbed. In three days, or even rather later, the egg becomes dull yellow brown in appearance to the naked eye. Under microscope it is seen to be mottled with brown, the ground colour remaining yellow. *Examined again September 25th.*—The eggs

have not yet hatched, but they have not fallen in, and look healthy. They are dull mulberry-brown with some light mottling. The eggs (three in number) all hatched October 1st and 2nd. LARVA: The newly-hatched larva is 1·6mm. in length. The head is pale grey speckled with dark brown. It is shiny. The brown specks apparently mark the places of the "lemon-rind" pits common to larvæ of the Satyrids. It bears numerous long stiff-looking pale grey hairs. Body colour, pale grey. There is a broad, light brown, dorsal line faintly marked on the thoracic segments, strong on the abdominals and increasing in distinctness towards end of body. Subdorsal and supraspiracular lines of the same colour, not so distinct but especially weak on the thoracic segments. I cannot see any other lines below. The tubercles are *very large*. They are black specks set upon warty bases of a dirty brownish-white colour. The anterior subdorsals (i) and supraspiraculars (iii) are especially large. The large subdorsals give the appearance of a "keel" along their line, making the dorsal centre look very flat. All the tubercles bear long, stiff, light brown hairs, these and the tubercles giving the larva an Arctiid appearance. The forks are merely two large tubercles, wide apart and diverging. They have not yet the appearance of the subsequent forks.—H. POWELL, 7, Rue Mireille, Hyères, France.

CURIOUS EGG-LAYING OF MELITÆA AURINIA.—This day I found a ♀ of *Melitaea aurinia* depositing in a field near Ham ponds. I am sending you the leaf with ova attached. She appears to have laid two batches of ova, but one batch of ova is partly deposited over a batch laid probably by another ♀, as those underneath have changed colour. It seems rather strange she should have chosen that leaf, as the food-plant occurred in abundance.—STUART G. HILLS, Public Library, Folkestone. *June 1st*, 1905.

NOTES ON THE LARVA OF OINOPHILA V-FLAVUM, HAW.—Early last summer I received from Mr. V. Eric Shaw a wine cork, containing two larvæ of *Oinophila v-flavum*. On commencing to pull the cork to pieces I saw various portions of the larvæ, but it was a very difficult matter to get them out of the cork. They had formed long, slender, tortuous galleries in the less sound portion (the upper) of the cork, and they moved along these galleries very rapidly. The only way to get the larvæ out was to break up the cork piecemeal. Even in doing this very carefully I fatally injured one of the larvæ; the other was put in a tin box with small pieces of cork, and fed up well. When fullfed, the larva was very long and slender, measuring 12mm. in length (when extended), but only 1mm. in width. Head rather large and flat, deep ochreous, partly retractile into the prothorax. The jaws strong. The thoracic segments are rather flat, but the abdominal segments are fairly cylindrical. The skin has a very translucent appearance when the larva is extended, but when contracted to about 6mm., as it often is in rest, the skin has a very wrinkled look. There is a strong lateral fold, but the segmental divisions are scarcely marked. The skin is covered, that is, encircled transversely with numberless lines of very minute hairs. The tubercles were difficult to see (as the larva was excessively active), but they appeared to be in the usual situations. They were small, simple, each with one bristle; the bristles being much longer on tubercle iv than on the others. The spiracles were somewhat raised above the surface of the skin. The

larva pupated without forming any special cocoon, and the moth appeared in a few weeks.—A. Sich, F.E.S., Corney House, Chiswick. *June 6th*, 1905.

VARIATION.

Nola confusalis ab. columbina, n.ab., in Epping Forest.—On May 22nd last, I took at rest on tree-trunks, in Epping Forest, two aberrations of *Nola confusalis*, H.S. (*cristulalis*, Dup.), which seem to be remarkable. The forewings are practically altogether of a soft grey, showing no white except on the scale-tufts. The first line is much less acutely angulated towards the costa than in normal examples. The hindwings are of an uniform silky grey. The ordinary form of this insect is singularly conspicuous when at rest on a tree-trunk, visible at a great distance, white as a snow-flake, and is not uncommon in Epping Forest at the end of May on hornbeam and oak trunks. These grey forms, on the contrary, are exceedingly inconspicuous. The aberration is striking, and seems to be unnoticed. If it were thought desirable to name it, I might suggest the name *columbina* as appropriate, for it exactly recalls the soft, silky, quaker-like greyness of a dove. Selwyn Image, 20, Fitzroy Street, W. *June 9th*, 1905.

NOTES ON COLLECTING, Etc.

Ovendenia septodactyla (lienigianus) at Croydon.—I have just discovered the larvæ of *Ovendenia septodactyla* (*lienigianus*) to-night somewhat abundantly at Croydon. I picked some foodplant for those I had collected, and found a dozen more larvæ on the pieces.—H. J. Turner, F.E.S., 98, Drakefell Road, New Cross, S.E. *May 23rd*, 1905.

Sesia sphegiformis in North Hants.—At Pamber, on Saturday, June 3rd, I cut out a pupa of *Sesia sphegiformis*, emergence took place the following day. The middle of the month is an average time for the appearance of this species. J. Clarke, Reading. *June 7th*, 1905.

Butterflies in Switzerland in 1904. The following is a list of some of the butterflies taken in Switzerland (chiefly Valais) between June 25th and July 14th, 1904. The season was an early one, many species appearing from a week to a fortnight in advance of their normal time. The weather was, on the whole, very favourable. I have not, as a rule, mentioned butterflies that are common and widely distributed. *Urbanus* (*Carcharodus*) *lavateræ*, near the Ganter Bridge on the Simplon Pass (July 6th and 8th); *Hesperia cacaliæ*, on the Simplon Pass (July 9th); *Pyrgus sao*, Martigny (June 28th); *Thymelicus actæon* on the road from Aigle to Le Sepey (June 25th); *Chrysophanus virgaureæ*, in several localities, but especially fine in the Laquinthal (July 12th); *C. hippothoë*, on both sides of the Simplon Pass (July 8th and 11th); *C. alciphron* var. *gordius*, Martigny (June 27th), Finhaut (July 1st), and Plynwald (July 3rd); *C. dorilis*, near Vevey (July 14th); *C. dorilis* var. *hippothoë*, Trient (July 2nd); *C. phlæas*, Trient (July 2nd); *Lycæna alexis*, a freshly emerged specimen, in the Laquinthal (July 12th); *L. arion* var. *obscura*, in the Laquinthal (July 11th and 12th), particularly fine; *L. amanda*, between Martigny and Vernaya (June 28th), ♂s very much worn, but ♀s in good

condition; *Polyommatus eumedon*, on the Simplon Pass (July 9th); *P. donzelii*, near Bérisal (July 8th); *P. hylas*, on the Simplon Pass (July 6th and 9th); *P. escheri*, abundant and very fine on the Simplon Pass between the second refuge and the Ganter Bridge (July 5th and 6th); *P. eros*, on the Simplon Pass (July 9th); *P. orbitulus*, on the south side of the Simplon Pass (July 11th); *P. pheretes*, near the fifth refuge on the Simplon Pass (July 9th), and in the Laquinthal (July 11th); *P. optilete*, one ♂ on the north side of the Simplon Pass (July 7th), and one opposite the old Hospice (July 11th); *Rusticus zephyrus* var. *lycidas*, both ♂ s and ♀ s in perfect condition and fairly abundant near the second refuge on the Simplon Pass (July 5th, 6th, and 8th); *Thecla ilicis*, Aigle (June 25th), Martigny (June 27th and 28th), Pfynwald (July 3rd), near Vevey (July 14th), nearly always in poor condition; *Parnassius delius* ab. *inornata*, on the Simplon Pass (July 9th); *P. delius* ab. ♀ *hardwickii*, on the Simplon Pass (July 9th); *P. mnemosyne*, fairly plentiful at Bérisal (July 6th and 8th), but all in a worn condition; *Pieris napi* var. ♀ *bryoniae*, in the Laquinthal (July 12th); *P. callidice*, at the top of the Simplon Pass (July 7th): *Leptosia sinapis* ab. ♀ *erysimi*, Pfynwald (July 3rd); *Colias phicomone*, plentiful near the top of the Simplon Pass (July 7th); *Argynnis niobe* var. *eris*, Pfynwald (July 3rd and 4th); *Issoria lathonia*, Pfynwald (July 3rd and 4th); *Brenthis daphne*, several good specimens at Martigny (June 27th and 28th); *B. amathusia*, Finshauts (July 1st), and in the Laquinthal (July 12th); *B. dia*, Aigle (June 25th), Martigny (June 28th); *B. pales* ab. ♀ *napaea*, on the Simplon Pass (July 9th); *Melitaea phoebe*, Martigny (June 27th and 28th), Pfynwald (July 3rd); *M. didyma*, Aigle (June 25th), Martigny (June 28th); *M. aurelia*, on the Simplon Pass (July 6th, 7th, 8th, and 11th); *M. parthenie*, Finshauts (June 29th); *M. athalia*, Aigle (June 25th), above Trient (July 2nd); *M. dictynna*, Aigle (June 25th), above Trient (July 2nd); *Limenitis camilla*, Martigny (June 27th), Pfynwald (July 4th); *L. sibylla*, Aigle (June 25th); *Apatura ilia*, one freshly emerged and very fine ♂ in the Pfynwald (July 4th); *A. ilia* ab. *clytie*, one worn ♂ near Vevey (July 14th); *Pararge hiera*, Finshauts (July 1st); *P. achine*, Aigle (June 25th); *Satyrus hermione*, Aigle (June 25th), Martigny (June 27th), Pfynwald (July 3rd); *S. circe*, two ♂ s and one ♀ near Vevey (July 14th), all fine and freshly emerged specimens; *S. cordula*, a particularly fine ♂ near the second refuge on the Simplon Pass (July 6th); *Epinephele lycaon*, Pfynwald (July 3rd), on the Simplon Pass (July 8th); *Coenonympha iphis*, Aigle (June 25th); *C. arcania* var. *insubrica*, in the Laquinthal (July 12th); *C. arcania* var. *darwiniana*, on the Simplon Pass (July 7th, and 11th),—this insect looks fresh on the wing, but it is not easy to get perfect specimens; *C. satyrion*, Trient (July 2nd); *Oeneis aëllo*, one ♂ and one ♀, both fine, near the top of the Simplon Pass (July 7th, 9th); *Erebia christi*, one rather worn specimen on the south side of the Simplon Pass (July 11th),—a search for this insect in the Laquinthal on July 11th and 12th proved fruitless, the season being an early one it was probably over; *E. mnestra*, on both sides of the Simplon Pass (July 7th, 9th, and 11th); *E. ceto*, Finshauts (June 29th), Trient (July 2nd); *E. stygne*, Finshauts (June 29th and 30th), Trient (July 2nd); *E. euryale*, extraordinarily abundant on both sides of the Simplon Pass (July 6th to 12th); *E. ligea*, very fine in the Pfynwald (July 3rd); *E. goante*, in the

Laquinthal (July 11th and 12th); *E. tyndarus*, on both sides of the Simplon Pass (July 7th to 11th); *E. lappona*, one specimen on the north side of the Simplon Pass (July 7th). The total number of species taken in the three weeks was 107, and named varieties being added, this number is increased to 125. In addition, three species were seen which we did not succeed in capturing. These included *Euranessa antiopa* (Simplon Pass, July 11th) and *A. iris* (Aigle, June 25th). In some places the wealth of insect life was extraordinary. Near Vevey, on July 14th, I took, with a single sweep of my net, two *Polyommatus damon*, two *Polyommatus corydon*, one *Theela ilicis*, one *Dryas paphia*, one *S. circe*, and four *Epinephele jurtina*, making eleven butterflies, including 6 different species.—J. N. KEYNES, M.A., D.Sc., Cambridge.

CAMPTOGRAMMA FLUVIATA AT ST. ANNE'S-ON-SEA.—Last November, I took a ♀ *Camptogramma fluviata* (*gemmaria*) on sugar, here. I did not know it was so rare about here until I saw in Ellis' *Lancashire and Cheshire Lepidoptera* that it had only been taken three times in this district. Unfortunately I had put it in the ammonia jar before I knew what it was.—T. BAXTER, Min-y-don, St. Anne's-on-Sea, Lancashire. *June 11th*, 1905.

NOTES FROM SOUTHERN FRANCE.—I arrived at Digne on May 1st; the season was an early one, and the insects and vegetation noticeably more forward than was the case at the same period two years ago. *Leptosia dupontheli*, which had been rare on the occasion of my previous visit, was quite abundant, more so in fact than *L. sinapis*. So far as my observation went it is a species occurring at lower levels than *L. sinapis*, frequenting the bottoms of the valleys, whereas the more generally distributed species occurs at all levels I collected at, up to, say, 1000ft. above the level of the town. *Anthocharis tagis* var. *bellezina* was, as usual, rare, and I could only get five examples. A fair percentage of the *Erebia epistygne* netted were in fair condition, at this late period for it. *E. erias* was fresh and very difficult to capture; plenty of *Nomiades melanops* and *N. cyllarus* were taken, with abundance of females of both species; *Lycaena iolas* was just emerging; *Cupido minima*, of the *alsoides* form, and in fine condition, were common; doubtless *Everes argiades* was not infrequent, but I could not find the headquarters, and only obtained one pair, which were taken *in cop.*; locally *Nemobius lucina* was an abundant species. The weather broke up on May 4th, and knowing, from past experience, what a hopeless place Digne is when the weather once breaks up at this period, I journeyed south in search of sun. Two days spent at Draguignan were spoilt by wet weather. Amongst imagines I saw nothing worthy of mention; but a search on the pellitory round the town revealed the fact that larvæ of *Polygonia egea* were to be found, and, by hard work, I collected about two dozen, from which some nice imagines have been bred since my return to England. These larvæ were invariably found on the plants growing on the walls, at a height of from two to eight feet, and on the sunny side; they were very easy to see, and fed exposed in the sun, no signs of a web being noticed. The larva is unmistakable, the pair of black spots on both sides of each segment, and the head, chestnut-coloured with black markings, making it easily distinguishable from the only other species of the genus that, so far as I know, occurs on the same plant, *Pyrameis*

atalanta, of which, by the way, I obtained three larvæ, and have bred the imagines since my return. From Draguignan I moved on to Hyères, arriving on May 9th, and remaining until the 19th. The weather, except for the last few days of my stay, was bad, with abundance of rain and absence of warmth. Consequently, certain of the species I had hoped to obtain were delayed in emergence, with a result that I only obtained few specimens in some cases, and, in others, none. *Melanargia syllius* was perhaps the most abundant butterfly, so far as the males were concerned; the females, however, were not fully out, and I had great difficulty in obtaining a modest series. *Epinephele pasiphae* did not emerge until May 15th, and only males were obtained, these, however, were plentiful on the last day of my stay. The best species observed was undoubtedly *Hesperia sidae*, of which I obtained a fine series of about two dozen examples; others could have been taken had I been so disposed. I should fancy this species is a widely distributed one in the district. I found it myself in two localities, and Mr. Powell informs me he has met with it in several others; its haunts are hollows in woods, on the edge of clearings; it does not appear to be anywhere abundant, or even common, eight or ten specimens representing a good morning's work. *H. sidae* is readily distinguishable on the wing from any other skipper flying at the same time, and is not particularly difficult to capture. Towards Carqueiranne, *Pontia daplidice*, in the second brood, was appearing, and was in fine condition; *Anthocharis belia* var. *ausonia* was flying, and with it were examples of the first brood, or at any rate of the typical form. *Chrysophanus gordius* was not unfrequent, males *passé*, females fine; *Euchloë euphenoides* was almost over; worn *Lampides telicanus*, fine females of *Thais medesicaste*, *Nomiades cyllarus*, and *Melitaea* var. *provincialis* were taken. In the cork woods, and, at the back of the town, *Papilio machaon* flew wildly, including ab. *aurantica*; very large *Aporia crataegi*, in both sexes, were well out; *Limenitis camilla* was fine and abundant; one or two battered *Euvanessa antiopa* were observed; *Melitaea cinxia* and *M. didyma* were common; *M. phoebe* and *M. athalia*, just emerging; *Brenthis euphrosyne* was nearly over; *Epinephele ianira* var. *hispulla*, males fairly common, one female only; *Urbanus* (*Carcharodus*) *alceae* was frequent; and one male *Thymelicus actaeon* was netted.—W. G. SHELDON, Youlgreave, Croydon. *June 12th*, 1905.

CURRENT NOTES.

Mr. Bagnall adds (*Ent. Mo. Mag.*) *Triplax bicolor*, Gyll., to the British list. It was taken with *T. aenea*, in fungus growing on elm and holly, at a height of from 4ft. to 12ft. from the ground.

The Hon. N. C. Rothschild notes that *Pulex cheopsis*, the flea usually associated with the spread of plague, was taken on *Mus decumanus*, at Plymouth, on April 16th, 1905. It is the first record of this species in Britain.

Mr. Luff has again laid entomologists under obligation in publishing two new local lists—one *The Insects of Herm*, the other *The Insects of Jethou*. He also issues a "Synopsis of the recorded Fauna and Flora of the Sarnian Islands," so far as lists of species have been published. It is difficult to estimate exactly how much we owe Mr. Luff for his excellent work in cataloguing the insect fauna of the Channel Islands.

The *Proceedings of the South London Entomological and Natural History Society*, for 1904-5, have just been issued. The volume consists of 104 pages and a chart of the Eynsford district, a favourite collecting-ground of the members of this society. There are a number of interesting papers and accounts of collecting expeditions, of which Mr. Sich's paper, "Notes on the genus *Coleophora*," is much above the average. Mr. Sich is an excellent observer, a clear expounder of his observations, and altogether in the first rank of entomological naturalists, a statement abundantly verified by his excellent Presidential address. The Rev. F. H. Wood's paper, "Notes on *Argyroneta aquatica* and some other Spiders," is also stimulating, and more or less an excellent model for papers read before such societies as this. Altogether a volume quite up to the usual standard, and well worthy of a place on the bookshelves of every British naturalist.

The May part of the *Transactions of the Hertfordshire Natural History Society and Field Club* (Dulau & Co., 37, Soho Square, London, W.) contains an interesting paper on the "Lepidoptera observed in Hertfordshire in 1904," by Mr. A. E. Gibbs, F.L.S., and another on the "Variation in Irish *Melitaea aurinia*," by Mr. V. P. Kitchin, B.A. All students of the local fauna will be much interested in the former, whilst the later will appeal even more widely.

Proposed new Natural History of British Butterflies.

The difficulty of getting copies of our work, *British Butterflies*, published in 1896, and then written to order, and not including any of the material that we had long been collecting for a really good advanced text-book, has recently led us into considerable correspondence with several lepidopterists as to the publication of a text-book on advanced lines. The large amount of unpublished first hand material that we have collected during the last 15 years is very considerable (the paper on which the notes are written weighs possibly more than a quarter of-a-hundredweight, and should be an excellent index of its value), and yet, when one begins to dissect it, one finds many little details concerning the biology of the commonest species, of which there appear to be no records, and hence progress in its sorting, arrangement and completion must necessarily be somewhat slow. It has been suggested that the book might be published monthly in 1s. parts, and, with the rest of our entomological work on hand, this appears to be the most that could be done, if the work is to be something more than a manual for school boys, and a book from which everyone can learn something. One supposes that there would be from 25 to 30 parts, and it would be illustrated by process work and photography, as completely as possible. Mr. Tonge has promised his aid with the eggs (in fact a large percentage of them is in hand), and larvæ, pupæ, and imagines of each species will, as far as possible, be given. The first part will be ready by September, 1907, in the meantime, it is necessary to appeal for a small guarantee list of subscribers, so that we can go forward without a possibility of actual loss. The life histories will follow, more or less, those in *The Natural History of the British Lepidoptera*, a little less in detail, and without such comprehensive lists of dates of appearance, and lists of continental localities as those to which some exception has been taken. The book will naturally be co-operative, an accumulation of the knowledge of many, and any help will be thankfully received. *Names should be sent to*—J. W. Tutt, 119, Westcombe Hill, S.E.

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EXCHANGES.—*The use of this column for the offer of Duplicates and Desiderata and Changes of address is open free to subscribers in far as there is space available.*

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The City of London Entomological and Natural History Society.—London Institution, Finsbury Circus, E.C.—The first and third Tuesdays in the month, at 7.30 p.m., except in July and August.

Toynbee Hall Natural History Society.—Held at Toynbee Hall, Commercial Street, E., Mondays, at 8 p.m. July 3rd, "Origin and Formation of Sedimentary Rocks," by E. J. Burrell (Lantern). Excursions: July 1st, Esher, Waterloo at 2.28 p.m. July 16th, Bookham, Waterloo at 10.5 a.m.

The South London Entomological and Natural History Society, Hibernia Chambers, London Bridge.—The second and fourth Thursdays in each month, at 8 p.m. July 18th, Exhibits; July 15th, Field Meeting, Clandon—Conductor, Mr. W. J. Kaye.

North London Natural History Society, Hackney Technical Institute, adjoining Hackney Downs Stations, G.E.R., at 7.45 p.m. The 2nd and 4th Tuesdays in the month. July 27th, "The British Taper Moths," C. P. Pickett.

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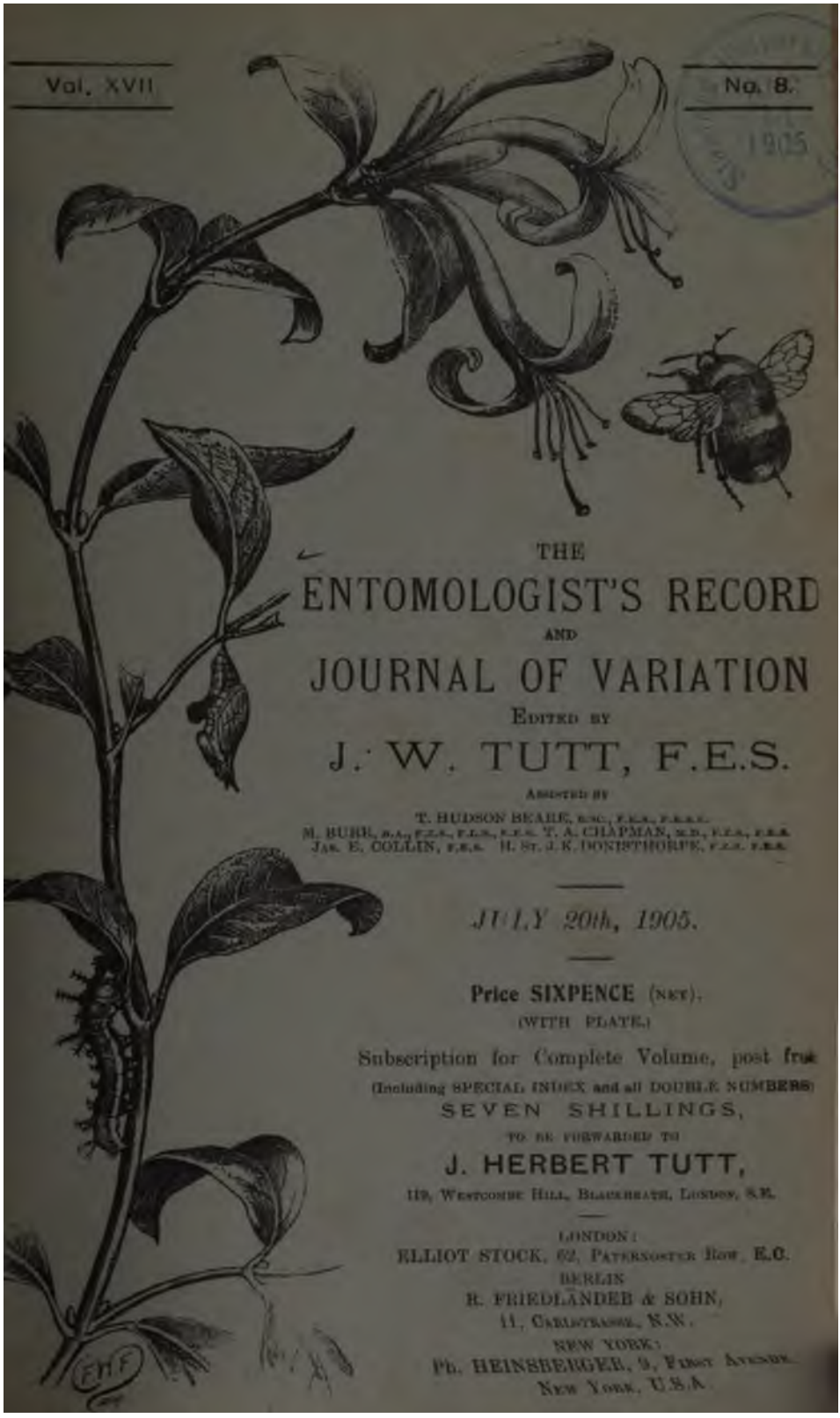

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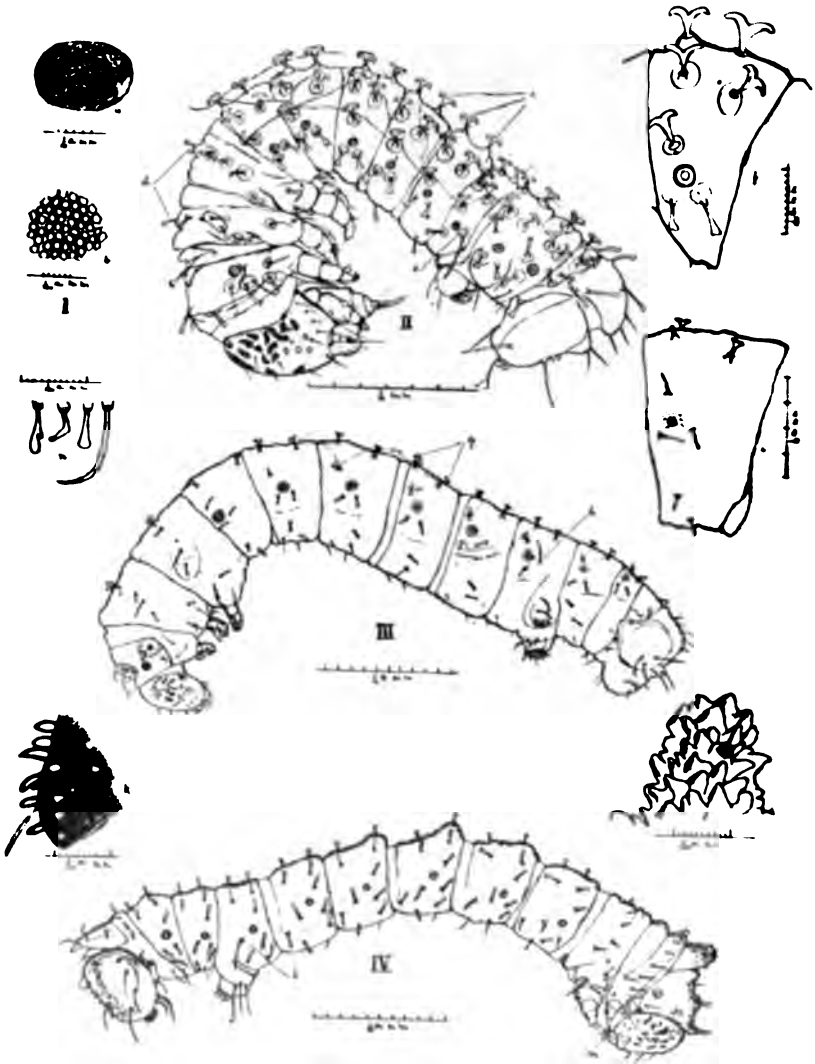

Geometra papilionaria, Linné.

Another Season among the Swiss Butterflies.

By GEORGE WHEELER, M.A.

The only entomological work which I attempted to do in the early part of the year 1904, consisted of an unsuccessful attempt to find the larvæ of *Melitaea aurelia* at Sion, on March 21st; I was accompanied by Mr. Sloper, and we spent hours in searching a field where the imago is generally common in May, but failed to find even one specimen. Five weeks later, however, on April 25th, a much shorter search was rewarded by a number of captures almost or quite full-grown; another search at Charpigny, on the 29th, for the larvæ of *M. parthenie* proving even more successful. Since, however, I am engaged on a paper on the Melitæas of the "athalia" group, I will not now say more than that the full-grown larvæ and pupæ of each species are quite distinguishable, especially the larvæ. Neither larva nor pupa of *M. berisalensis*, which both Mr. Sloper and I have also bred, bear more than the general Melitæid resemblance to them or to *M. athalia*. Two visits to the Pont de Pierre, between Glion and Les Avants, on April 11th and 28th, produced nothing but the ordinary spring species, with the exception that *Pieris brassicae* was conspicuous by its absence; and the same may be said of Aigle on the 12th (except for one ab. *immaculata* among the *Callophrys rubi*), of Sion on the 25th, and Charpigny on the 29th, as far as butterflies are concerned; but *Aglia tau* was remarkably common on the latter day, and, being in a couple of open fields, was much less difficult to catch than usual.

After this a long interval elapsed, during which I was unable to do any hunting, and, though Mr. Sloper and Mr. Fison kept me well informed of their doings, there is little to chronicle. The latter had a large take of *Chrysophanus amphidamas* at Caux, on May 30th, but, on trying the same locality on the following day, I was unsuccessful, the day turning cold and wet; on June 3rd, however, I took three in fair condition, and all ♀s, though the day was dull. *Erebia oeme* and *E. medusa* were also abundant, though only the ♂s of the former were to be seen. On June 6th began a month's sojourn at Bex, and, on the whole, I think I have never seen such a profusion of insects as I saw during that month. They swarmed almost everywhere, but the banks of the Gryonne, canalized though they are, produced greater numbers and in greater variety than any other part of the neighbourhood. No time was lost after arrival in trying for *C. amphidamas* at Villars, another of its localities, or rather between Villars and Chesière in the marshy spots off the road to the right, turning up by the saw-mill, and I took ♂s in very fair condition on the 7th; at the same time and place *Polyommatus eumedon* was very fresh, common and exceedingly fine, and I took a fresh and fairly well marked ♀ *P. bellargus* of the *ceronus* form. *Melitaea aurinia* was also to the fore. On the 11th, I made an expedition to Caux, expecting to meet Dr. Crowfoot and his daughters, but, having missed the train at Territet, I failed to find them, but took *C. amphidamas* in much better condition than I had previously procured it. It appears that this species emerges in a continuous brood, but whether it is the larval or the pupal stage that varies in duration I have as yet no means of determining. *C. hippothoe* was very fresh, *Pararge hiera* a good deal worn, and my single annual specimen of *Carterocephalus palaemon* was also obtained

that day. On the 13th, an expedition through Frenières and Les Plans to, and above, the Pont de Nant, did not produce anything exciting, but at Frenières I took one dark specimen of *Melitaea athalia* ♂, the central light band of which, underside hindwing, was of a pearly whiteness suggestive of Rühl's var. *helvetica*, but the upperside did not correspond with his description. At Les Plans, butterflies were very few, but above the Pont de Nant I met with *Pararge hiera*, *Pieris* var. *bryoniae*, and a very large specimen of *Coenonympha satyrion*. On the following day, *M. athalia*, *Limenitis sibylla*, and *Pararge achine* literally swarmed at Charpigny, as was also the case on the 16th, when *Thecla spini* and *T. ilicis* were likewise fairly numerous. On the 17th, I went for the day to Martigny to meet Dr. Crowfoot and his party. Following the old route under the cliffs, towards Vernayaz, we succeeded in taking most of the species of which my companions were in search, especially may be mentioned *Brenthis daphne*, *Lycaena amanda*, and *Erebia stygne*. *Limenitis sibylla*, which is very rarely found so far up the Rhone valley, also put in an appearance, and I took a fine ♀ *Chrysophanus virgaureae*, which one also very rarely finds at so low a level. On this occasion I also found five larvæ of *Saturnia pyri* in an early stage; two of them died during the following moult, and the other three came, alas! to a bad end later at Fusio, at the hands of a non-entomological *femme-de-chambre*.

On the 20th, train to Aigle, and a walk back with Mr. Sloper to St. Triphon station. We took 2 *Apatura ilia* and saw *A. iris*: *Pararge achine* was very abundant and so was *Brenthis ino*, the latter, however, being somewhat worn. We secured a number of larvæ of *Euvanessa antiopa*, and, at Charpigny, I at last succeeded in taking three specimens of *Thecla acaciae*, though none were in really first-class condition. *T. w-album* was also taken, but how difficult it is to set Theclas without spoiling them. Another specimen of *T. acaciae* fell to my lot at the same place on the following day, and I also took, at Charpigny, a specimen of *Parnassius apollo* whose large crimson spots were quite without white. This form, of which I have taken several specimens during the last two years in different localities, presents a very remarkable facies, especially when the spots are large, and seems much more worthy of a name than several forms which have been dignified with this distinction; had I known how wide-spread it is at the time of publishing my book, I should certainly have named it then. Mr. Tutt has, I understand, recently named it *rufa*.

On the 23rd I took train to St. Maurice, walking back to Lavey. At the latter place, amongst other things, were *Limenitis camilla* and *L. sibylla*. *M. athalia* was abundant but small, a few ♂ *Satyrus cordula* had appeared, and I took one specimen of *Brenthis daphne*, the first record for the Canton of Vaud. Mr. Sloper, by the way, has added another species to the fauna of the Canton, having taken several specimens of *Lycaena amanda* in the marshy ground between St. Triphon and the railway. On the following day I walked up to Frenières, when I found *Brenthis ino* still fresh, *Melitaea athalia* abundant, *Brenthis amathusia* and *Coenonympha iphis* in some numbers, and a plentiful but very small brood of *C. hippothoe*. I took also a specimen of *Polyommatus escheri*, which seems to have now established itself in this corner of the Canton. Next day I went to Aigle to meet Dr. and Mrs. Keynes, and had an interesting walk with them up the *Sepey road*. The weather was not propitious, but we took many of

the species generally to be found there at this time of year, including *Apatura iris* and *Pararge achine*, on the way down, and at the side of the first short cut, I took a couple of specimens of *Thymelicus actaeon*. On Monday, the 27th, I met the same friends at Vernayaz, and walked across the valley and down by the narrow cliff-path to the *Colutea* patch, but saw no signs of *Lycaena iolas*; we took, on the way, several *Brenthis daphne*, which was difficult to find now in good condition, as well as *Satyrus cordula*, *Chrysophanus virgaureae*, &c., but the wind was truly awful, and came, as it very seldom does, right up to the cliffs. On the 28th, I went no further than the banks of the Gryonne, where, amidst a vast profusion of insects, the only capture unusual in these parts was the type form of *Argynnis niobe*. On the 29th, I went from Aigle through Yvorne and Corbeyrier to Luan, and the mountain behind it. On the way up I saw practically nothing, but just above Luan I came across a specimen of *Enodia hyperanthus* ab. *caeca*, and, by dint of netting, and turning out again, some 50 specimens, I succeeded in taking three more of the same form. Further up were a fair number of Erebias, *Erebia ligea*, *E. ocme* and *E. melampus*, as well as the large Argynnids, and a very few specimens of *Lycaena arion*. On the way down I came across numbers of *Aporia crataegi*, still very fresh even below Corbeyrier, and also the first specimens of this year's *Polyommatus damon*. A walk on the banks of the Gryonne, on July 1st, showed that *Dryas paphia* was now out, as well as the 2nd brood of *Cupido sebrus*; I also took a pair of *Zephyrus quercûs*. The next day we returned to Montreux.

On Monday, July 4th, I met Mr. Muschamp at Lausanne, and we started together for the wood, where he had so large a take of Apaturids last year (1903). The day was not all that could be desired, but the morning was very bright and we arrived early on the scene, and large as had been the expectations I had formed, they were in no way doomed to disappointment, except that the first freshness was worn off both species, especially *A. ilia*. Of course the majority of examples kept high up in the trees, but during the whole time, up to 2 p.m., when it clouded over, there were always many in sight, and a very fair proportion descended to the road. The most remarkable thing was the large percentage among the numbers of *A. iris* which were either ab. *iole* or a transitional form. These amounted, I should say, to 15 per cent. at least. Amongst the *A. ilia* were many var. *clytie*, but these were unfortunately for the most part worn and torn. The only other abundant species were *Eugonia polychloros*, *Dryas paphia*, and *Aphantopus hyperanthus*, but two specimens of *Satyrus circe* were seen and one taken. Having taken one of the very useful tickets which permits one to travel anywhere in Switzerland, except on the mountain railways, for a month, I spent July 6th again in the same locality, where, in addition to such things as I had seen two days before, I took a ♀ *A. iris*, and another ♀ of almost *iole* form, as well as the corresponding, but much scarcer, ab. *iliades* of *A. ilia*; a ♀ *Thecla acaciae* also fell to my lot that day. In the evening I went on as far as Berne, and the next day to Weesen, on the Lake of Walenstadt, stopping between trains for a look at the famous pilgrim resort of Einsiedeln. It was quite a new kind of country to me, and in some respects should be entomologically good, but I had not time to test its productiveness. Finding Mr. Fison and Mr. Lowe at

Weesen, I went the next day in their company up to the Thalalpsee in quest of *Brenthis thore* and *Araschnia levana*. A few specimens of the former were obtained in very fair condition, but the latter was quite over, and even a look for second brood larvæ was quite unsuccessful. Mr. Fison had, a short time previously, taken the species there and in the neighbouring Murgthal in abundance, most of the specimens being of a large and light form, and later, at the beginning of August, he took the *prorsa* form as abundantly; but we were just between the broods. *Parnassius mnemosyne* had been there but was now worn out; *P. apollo* and var. *pseudomonion* were out; *Melitaea dictynna*, very light; *Brenthis amathusia* and *Erebia stygne*, were also to be taken, and at the very top of the pass Mr. Fison netted a fine form of *Apatura iris*. On the way down through the fields to Filzbach a fine form of *Erebia melampus*, some specimens closely approaching var. *sudetica*, was common, and in Weesen-marsh *Lycaena euphemus* and *L. arcas* were still to be seen, though mostly a good deal worn, and *Brenthis ino* was abundant. The following day I was obliged to return to Montreux, which altered my plans, which had included Davos and the Engadine, but took advantage of my ticket to spend Monday, the 11th, in the Pfynwald. I found nothing but the usual species, but *Polyommatus meleager* was very fresh and not uncommon, and *Melitaea athalia* also fresh and abundant, which I had not previously found to be the case here.

On the evening of the 14th, we started for South Switzerland, led on by the hope of *Erebia flavofasciata* and *Heteropterus morpheus*, and stopping the night at Olten, reached Bellinzona the following day, having waited between trains at Faido. Here I had hoped to meet with *Parnassius apollo* ab. *neradensis*, but, though I took some yellowish specimens, they were too worn to keep, and I think their colour was merely an indication that the red of *P. apollo* "won't wash." I took, however, two fine specimens of *Dryas* var. *valesina* at one sweep of the net, and met with various species of the genus *Chrysophanus*, including large *C. virgaureae*, *C. phlaeas*, *C. dorilis*, and one very fine ♀ *C. gordius*. After a night at the Hotel de la Gare, at Bellinzona (very convenient), we started for Fusio, staying on the way at Reazzino to hunt (alas! unsuccessfully) for *H. morpheus*. Many species, however, were abundant, including *C. phlaeas*, very dark, *Brenthis selene*, *Melitaea phoebe*, very unicolorous, *Polyommatus orion*, *Plebeius argus*, *Papilio machaon*, and *P. podalirius*, *Epinephele tithonus*, etc., *Carcharodus alceaeae* and *C. althaeae* were also present. For the sake of any other persons who may contemplate going by diligence to Fusio, it will be well to mention that it is absolutely necessary to telegraph beforehand for seats in the diligence from Bignasco on, as there are no "supplements" there. Not knowing the necessity for this, we were stranded at Bignasco and obliged to spend the night there, proceeding to Fusio the next morning. I should like to enlarge—non-entomologically—on the beauty of the Val Maggia and its exquisitely graceful bridges, but must refrain, lest the editor should decree the excision of such a passage; still I *must* say that it is more than worth a visit. Monday, the 18th, was spent on the Alpe Pianascio, without success so far as *Erebia flavofasciata* was concerned; certain other Erebias were, however, abundant, viz., *E. euryale*, *E. melampus*, *E. tyndarus*, and a form of *E. epiphron*, very near to *cassiope*. *Polyommatus corydon* and *P. eros*

were also common, and *Brenthis pales* abundant. On the slopes, just above Fusio, *Parnassius apollo* was in great variety as well as abundance, and I took a fine orange ab. *nevadensis*. The following day I walked down the valley towards Peccia, being induced to do so by what I had seen in driving up. A large form of *Erebia melampus* was very abundant; as also was the largest form of *Chrysophanus virgaureae* that I have ever met with; there were numbers of *Erebia euryale*, *Argynnis aglaia*, and *A. niobe* var. *eris*, and some *A. adippe*, but to my disappointment not a specimen of var. *cleodoxa*. *C. hippothoë* was represented by its var. *eurybia*, and, so far as I saw in coming up, var. *valesina* is the only form of the ♀ *Dryas paphia* in the valley, but on this day I only got down low enough to find one specimen. *Erebia goante* was also in evidence, but not abundant. *Parnassius apollo*, as on the previous day, abundant and varied. On the 20th I went to the top of the Campolungo Pass, though I was assured I should never find my way through the woods alone. My first *Erebia flavofasciata* was taken at about 6600ft., just at the furthest point at which I had arrived two days before. This specimen was very worn, and had it not been my first I should not have kept it. I saw no more for another 600ft., but there I took two and missed a third; at the top of the pass, and on the higher slope to the left, *i.e.*, between 7600ft. and 7800ft., I took five more, including one female, mostly in very good condition, and varying considerably in the depth of colour of the characteristic yellow band, the lightest being quite pale, the darkest a deep brownish-orange. This species was also taken in some numbers near Pontresina this year, very few specimens, however, occurring at the part of the Schafiberg where Mr. Fison had taken them three years ago, but a good many on a path parallel with it. Thursday the 21st, was entomologically a "dies non," and early on Friday morning we bade a reluctant farewell to Fusio. Arriving at Locarno we took train for Bellinzona, though I stopped again at Reazzino to renew my hunt for *Heteropterus morpheus*. Again I was unsuccessful, but, in addition to the species I had taken the previous week, I took several Melitæas, which I concluded must be Assmann's *britomartis*: about 1.30 however it turned wet, and I took an earlier train to Bellinzona than I had intended. The following day I went by train to Castione (the next station), and walked thence to Roveredo at the entrance of the Misox Valley. I took but little till just before reaching Roveredo, that little, however, including, to my surprise, *Pararge hiera*, but on the mint, which grows abundantly by the roadside shortly before reaching the little town, *Chrysophanus phlaeas*, *C. dorilis*, *Polyommatus orion*, and *Coenonympha pamphilus* were abundant. Beyond Roveredo I took a few *Erebia aethiops*, and on my way back a few *Melitaea athalia*, *Lycaena arion*, *Hipparchia semele*, and a number of *Epinephele tithonus*. I did not, however, see either *Libythea celtis*, which I had hoped to find, nor *Neptis lucilla*, which M. de Buren has since informed me, was taken there by himself and Dr. Steck in July 1893. On Monday, the 25th, I made a last unsuccessful visit to Reazzino for *H. morpheus*. I took, however, a good many more *Melitaea britomartis*, and a few small *M. athalia*. The former vary considerably on the upperside, a few decidedly resembling *M. parthenie*, others closely resembling *M. aurelia*, and one or two approaching *M. athalia*: all are about the size of *M.*

aurelia, slightly larger on the average than Rhone valley specimens, though a few are smaller, and *all* on the underside have the dark spots on the ante-marginal band of the hindwing which are otherwise peculiar to *M. dictynna*. Seeing them together they are undoubtedly all one species, and some of them, especially one ♂ and one ♀, bear out exactly the description of *britomartis* according to Rühl, a description made from a specimen identified by Assmann. My specimens are also identical with those from Silesia, labelled *britomartis* in the Natural History Museum at Berne. With this opportunity of careful examination I feel no doubt as to the specific value of *britomartis*: its nearest neighbour I should take to be *M. dictynna*, though the average of *dictynna* is considerably larger, and no *dictynna* that I have ever seen is nearly as light on the upper side; moreover, I took one specimen of the latter species at Reazzino, it was rather smaller and lighter than the more northern specimens, but was far from being as small or as light as the largest or darkest of the former species, moreover, it was worn out, while *britomartis* was in excellent condition. I hope it may be within my power to find out next spring what the first brood is like, and I should also much wish to compare the earlier stages with those of the other Melitæas of this group. The other captures of this day were the same as on previous occasions but included a small but very brilliant specimen of *Apatura ilia* var. *eos*. A visit to Mendrisio (a most interesting old place, on the following day produced a good catch of *Everes argiades*, type, about five minutes' walk from the station, and also one rather worn specimen of *Lampides telicanus* (my first) about 100 yards further on. An early start on the following morning enabled us to make a visit to Como and up the lake to Cadenabbia in search of *Coenonympha oedipus*, time however, was short, and a few *Melitaea athalia*, *Epinephele tithonus* and *E. jurtina*, with a single specimen of *Enodia dryas* were the only results. The heat that day at Como was intense, making the contrast to the glacial cold of the Oberalp Pass, where we arrived next day, in a biting wind with no sun, all the more severe. There were but few butterflies on the way up to the Lautersee on the following morning; a few *Colias palaeno*, the ♀s being white, and a few *Brenthis pales*, being all that were seen. In the afternoon a walk to the top of the Calmot resulted in a few *Erebia gorge*. The 30th was much warmer, and on the Oberalp in the morning I took, besides the above species, *Colias phicomone*, *Erebia manto*, *Polyommatus pheretes*, *Plebeius argus*, *Nomiades semiargus*, and two very fine examples of *Brenthis pales* ab. ♀ *napaea*, and at the northeast corner of the lake, and on the slopes above, *Parnassius delius* was fairly common in the afternoon. These, with *B. pales* var. *isis*, *Erebia goante*, *Parnassius apollo*, very large and dark, but worn out, and *Nemeophila plantaginis*, in endless variety, were the only species I saw on the Pass, though I took *Pamphila comma* on the way down on August 1st, on which day I also walked across the Urserenthal to Hospenthal, and thence to Goschenen. The valley at this time of year seems wonderfully destitute of butterflies, I do not think I saw one, and even between Andermatt and Göschenen there was scarcely anything flying. A journey down to Lucerne and Alpnach by lake, and thence on the following day by the Brunig Pass and down the lakes of Brienz and Thun, and so by Berne and Lausanne to Montreux, brought a most interesting month's tour to an end.

One further visit I paid to Eclépens, on August 4th, in hopes of finding more *S. circe* but in vain. In the marshy fields close to the station in the direction of La Sarraz, I found, however, a considerable number of *L. arcas*: they were mostly worn, but one or two females were still in excellent condition; this was of course very late, but Professor Blachier has reported this species from Divonne for August. The specimens were very large, and I do not think it very likely that they represented a 2nd brood. Twice at the beginning of the following week I saw *Satyrus circe* in the street at Montreux, quite close, but on neither occasion had I a net. At Charpigny, on the 10th, the usual 2nd broods were abundant, including vast numbers of *Melitaea parthenie*. *Epinephele jurtina* was present in swarms, with much variety of colouring in the females on the underside, and *E. tithonus* was as numerous as usual in this its one locality in the Rhone Valley.

Starting the next evening to Sierre I walked on the following morning up the Val d'Anniviers as far as Vissoye. Near Niouc I took *Satyrus alcyone* and *S. statilinus*, and *Hipparchia semele*, and at Fang one female *Zephyrus betulae*; but butterflies were not plentiful till near Vissoye, when *Parnassius apollo* and the three large Argynnids appeared in some numbers, just before reaching the village a few ♂ *Chrysophanus virgaureae*, and many female var. *zermattensis* were found resting on the flowers of the mint, where they were still abundant in the afternoon. The next day I walked on to Zinal, but saw very few insects until the last mile or so, when *Erebia tyndarus*, *Hesperia alveus* and *H. serratulae* and *Pamphila comma* became abundant as well as the large Argynnids; there were also a few *Erebia goante*, and *E. euryale*. On the 15th, a walk up the Alp Arpitetta produced one ♀ *Polyommatus donzelii*, *Parnassius apollo*, very small, *Nomiades semiargus* var. *montana*, and *Brenthis pales*, together with the three Hesperiids and the three Erebias taken at Zinal. I also found, near the latter place, an ideal spot for *Brenthis ino*, where no doubt Chanoine Favre had taken his var. *zinalensis*, but the species must have been over. On the following day I went to the top of the Corne de Sorrebois, where M. Wullschlegel has taken various interesting things, but towards the top I saw only *Erebia gorge* and *E. tyndarus* ab. *caecodromus*, lower down *Parnassius delius* and one specimen which might perhaps be a hybrid with *P. apollo*, in company with *Brenthis pales*: lower still a specimen of *Melitaea aurelia*, and a number of *Polyommatus donzelii* ♂ and ♀, most of which were unfortunately getting worn, and also a few *Erebia goante*. The most remarkable sight was the laden bushes of wild red currants, the fruit being quite as large as one sees on ordinary garden plants in England, and immensely more abundant. On the 19th, I walked down to Sierre, but took nothing on the way which I had not seen on my way up, and with my return to Montreux the same evening my butterfly season practically closed. It is now so seldom that I take a new species in Switzerland that the capture this year of *Brenthis thore*, *Polyommatus donzelii* ♀, *Everes argiades*, type, *Lampides telicanus*, *Melitaea britomartis*, *Erebia flavofasciata*, *Satyrus circe*, and the Apaturid forms *clytie*, *eos*, *iliades* and *iole*, make this season a memorable one, notwithstanding the failure to meet with *Heteropterus morpheus*.

Geometra papilionaria, Linné (*with plate*).

By the Rev. C. R. N. BURROWS.

The insect which I have the privilege of bringing to your notice is one which has two distinct claims upon us, as naturalists and entomologists. First, because on account of its size and great beauty, its capture is always regarded with a comfortable feeling of satisfaction, even though, in the south of England at least, it is by no means uncommon; and, secondly, because it is an insect about whose name there cannot be the least question. Happily for us, the name which Linné gave to it is unchangeable, and will belong to it while lepidopterists collect, and while the world lasts. But, although there is no doubt about the name, there is very considerable confusion as to what the great Swedish naturalist meant to describe, what form he had before him, *i.e.*, what is our type. The investigation proving to be quite beyond my own powers, our good friend Mr. Prout, who, I believe, revels in such matters, has been kind enough to absorb, digest, and condense for me, the numerous works in which Linné gave to the world, what I may perhaps be allowed to call the first attempt on the part of man, since Solomon, to arrange the works of Nature. Mr. Prout writes, "In 1746, Linné introduced this species without a name—this being before the days of binomial nomenclature—in his *Fauna Suecica*, ed. 1 (1746)*, no. 922, but he described it so vaguely, and badly, that it would be hardly recognisable but for his own citations in his later works. In 1758, in his *Systema Naturae*, ed. 10, he redescribed it, and gave it the name of *Phalaena* (*Geometra*) *papilionaria*†, by which name it has since been almost universally known, although Hufnagel, in 1767, named it *prasinaria*. Linné's best description of the species is given in the second edition of his *Fauna Suecica* (1761), p. 34, which shows that he was describing from a tolerably normal specimen, having the two outer lines of the forewing weakly defined, and the basal line indistinct. He writes:

"*Phalaena* (*Geometra*) *papilionaria* pectinicornis, alis omnibus viridibus: strigis duabus albidis undatis; posticis repandis; antennis flavis. Habitat in Tilia. Descrip. Magnitudo *Papilio brassicae*. Alæ virides: strigis duabus posterioribus albidis, obsoletis, undulatis, cum rudimento tertiæ versus basin: Inferiores alæ margine repandæ, similiter pictæ. Antennæ et pedes flavescentes."

This translated reads: Pectinated antennæ, all the wings green; two waved white stripes; hindwings with margin sinuous; antennæ yellow. Lives on lime. Description. Size of *Papilio brassicae*. Wings green: two posterior, obsolete, undulated, white stripes, with the rudiment of a third towards the base: hindwings with the margin sinuous, similarly marked; antennæ and legs yellowish *Fauna Suecica*, ed. 2 (1761), p. 326. Linné's description of the type as possessing "strigæ obsoletæ" proves that the form he was describing had not any distinctly defined lines. Hufnagel‡ mentions three trans-

* *Phalaena* alio virescens, alis planiusculis. Habit. Upsaliæ. Descrip.—Tota ejusdem color inter album et viride medii, magnitudine ad *urticariam* 744 facile accedens. (The said *urticaria* stands for our *Vanessa urticae*.—L.B.P.)

† *Phalaena* (*Geometra*) pectinicornis, omnibus viridibus erectis: striga sesquialtera pallida repanda. Habitat in Thymo. Fn. Svec. 922. (*Systema Naturae*, ed. 10, tom. 1, p. 522 (1758).)

‡ *Berl. Mag.* v. p. 506, 1767. *Phalaena prasinaria*, grass-green, with three narrow yellowish-white interrupted transverse stripes running parallel.—L.B.P.

verse stripes without indicating that the basal is more rudimentary than the others, so perhaps his name *prasinaria* may stand for the more strongly marked form."

Linné's collection is now in London, in the care of the Linnean Society, at Burlington House. I have carefully examined the four specimens which are in his cabinet. Of these, two are very ancient, the others appear to be of a later date, and have possibly been introduced into the collection since Linné's day. Of the ancient pair, the first is so evidently the older, that it may well be the very specimen from which he wrote his original description. It is unset, and so faded that it has no trace of green remaining, and no markings are to be discovered. The second, whose body has been devoured by mites, shows possibly the two outer lines, but the base of the wing is too much faded to show whether the basal line ever existed.

Staudinger and Rebel give (*Catalog*, 3rd ed., p. 261) *herbacearia*, Ménetries (*Bull. Ac.*, xvii., p. 112) as a questionable synonym, or even aberration of *papilionaria*, with the concise description—"ab. al. non albo-signatis." Ménetries [*Schrenck's Reisen, im Amur Lande*, ii., pt. i., p. 66 (1859)] describes this form as smaller than *G. papilionaria*, the forewings shorter, and more rounded at the apex, and as differing also in the structure of its palpi. Staudinger, however, in his paper on the "Geometridæ of Amurland" (*Iris*, vol. x., p. 4), says that he has obtained *G. papilionaria* commonly from that country and suspects that Ménetries' *herbacearia*, which was founded upon a single specimen, must have been a somewhat wasted aberration of the same, lacking the usual white markings. So far as I know, these are the only forms of the insect under review, which have received varietal names, and I have set myself the task of enquiring, from as many collectors as I could manage to approach, whether these, and any other forms, are taken in Britain. To those who have replied to my enquiries, I tender most hearty thanks, their assistance enabling me to understand better the different forms assumed by this insect.

1. Commencing with Linné's type, we have a form in which, on the forewing, the basal line is indistinct, incomplete, or even absent. The second line is composed of crescents, placed between the nervures, and often increasing in width to the space between the submedian and median, the crescents so placed being most conspicuous and persistent. The third, or subterminal line, is made up of pale spots or blotches, between the nervures, varying much in size, from mere specks to distinct dots, forming a series from the costa almost to the hind-margin. The hind-wing has the two transverse lines corresponding to the principal lines on the forewing. All the lines present in this form are more or less indistinct.

2. Ab. *prasinaria*, Hufn.—This must not be confounded with *prasina*, Butler, which is placed next to *papilionaria* in the general collection at the British Museum. We may safely assume from Hufnagel's own description, that this name belongs to those specimens in which all three transverse lines on the forewings, and the two on the hindwings, are quite distinct, although, of course, still more or less made up of dots or crescents. There is a magnificent specimen of this form in the general collection at the British Museum, from Tokio, and strongly marked specimens are not infrequently taken with us.

3. Ab. *herbacearia*, Ménet.—After reading Staudinger's remarks

about this form of variation, one feels justified in applying the name to the much more unusual aberration, in which the pale transverse lines are absent on all the wings. It is a curious point, to call to mind, that, in Linné's first description of the insect, he mentions no lines at all (*Fauna Suecica*, ed. 1 (1746)). I exhibit the best specimen of this aberration which I have been able to find, bred last year by Mr. L. W. Newman of Bexley, to whom I must express my thanks for his kindness in placing at my disposal his large stock of the insect.

4. Ab. *cuneata*, n.ab. I now come to a form, which I had never met with, until the fine bred specimen before you was sent to me by Mr. Herbert Massey. This would be merely typical were it not for the development of a large white triangular or wedge-shaped spot on the basal side of, and in contact with, the lunule on the forewing. I have heard of several more in the possession of other collectors. Mr. Massey's is, however, still the finest I have so far seen. I would point out that the spot is not, and, indeed, cannot be, the effect of mere bleaching. The specimen is quite fresh, the spots are definite and symmetrical, and occur in other individuals of this species.

5. Ab. *subcaerulescens*, n.ab. I am quite prepared to meet with criticism as to the aberration which I mention next. A few specimens picked from many more, seem to me, to be distinctly blue-green, or shall I say bluer green than the bulk of the specimens, for I have been told that the colour of *G. papilionaria* is always blue-green. I confess that the tint is not so very striking, and that I myself cannot always see it. But the specimens in which it occurs are fresh, and, in fact, generally in the finest possible condition. I have also been told that the colour is the result of fading, or of the method by which the insect has been killed. I should be deeply obliged to anyone who would let me know of a specimen which had been turned blue by any process of killing, or of preservation. *G. papilionaria* fades to yellow, or dirty white. Seven interesting specimens are to be seen in the Natural History Museum which have been ruined by resetting, the damp having discharged all the green and left them quite yellow. Few people use cyanide or ammonia for killing green insects, but I believe I am right in saying that neither of these poisons injures this species, if judiciously applied, although, if the action be continued too long, the colour will be changed to yellow. I have submitted dry specimens to the action of ammonia for an hour without any trace of effect. I cannot recall the action of the laurel jar of bye-gone days, but am sure I should, if it changed green moths to blue. The only true blue specimen of *G. papilionaria* which I have come across, is the fourth in the series of the Linnean collection, to which I have referred above, and I should much like to know, whether it was born so, or if not, whether the colour is the result of old age, or of the disease of which it died. I am myself so satisfied that some specimens are more blue than others, that I venture to include this form amongst those worth looking for. But, after all, colour is largely a matter of individual judgment, and amongst the most dangerous questions to raise in company.

6. Ab. *subobsoleta*, n.ab. Another somewhat unusual form is that in which both basal and subterminal lines are absent on the forewing, and the subterminal on the hindwing, leaving only the second

line on the forewing, and the central line on hindwing. The result is an insect, with but one transverse line on each wing. The seventh specimen in the English collection at the British Museum is a good instance. This appears to be merely the transition form, intermediate between ab. *herbacearia* and the type, a stepping-stone in fact, I dare not say whether up or down.

7. Ab. *deleta*, n.ab.—There are, in the general collection at the Natural History Museum, three specimens, numbers 5, 6 and 8; two females and a male, which have the basal and second lines only. I do not know whence they came, and have none like them.

Besides these aberrations there are recorded a few other noticeable forms. Sir J. T. D. Llewelyn captured in 1866-1867, in the neighbourhood of Neath, South Wales, three specimens of a rich cream colour (Barrett, *Lepid. Brit. Islands*, vol. viii., p. 282). These, or similar specimens, were exhibited at the meeting of the Entomological Society of London, on April 12th, 1893. I wrote to Sir John Llewelyn about them, and he informed me that he had bred the same form. Mr. Capper tells me that he also bred one entirely yellow. On the same page of Barrett's *British Lepidoptera*, given above, is recorded a specimen belonging to Mr. B. A. Bower, in which the hindwings are clear smooth white except a large green blotch near the base.

I have before me a specimen bred by Mr. Pickett, which is scarcely green at all, but it is a hopeless cripple, and no doubt its want of colour proceeds from malnutrition. Green moths are notoriously liable to lose their colour, and we all know how necessary it is to be careful to avoid the least indiscretion which may discharge the beautiful, but evanescent hue. I believe that *G. papilionaria* is the least liable to fade of all, and that treatment which would ruin *lactearia*, *vernaria*, *smaragdaria*, etc., is comparatively safe with this insect. I have alluded to the use of cyanide and ammonia for killing purposes by some collectors, who hold that, with due care, no harm results, others, who fear these means, commonly prick with oxalic acid. I confess that I have some doubt about the use of this substance, as I do not like the permanent presence of a powerful acid within the thorax of the dried specimens. I notice that most of the specimens of *G. papilionaria* in the Doubleday collection, have faded to yellow at the base of the wing. Of course, these specimens are more than thirty years old, and one does not know how they were killed, but I certainly prefer the use of "*essence of pipe.*" It is curious that Linné, giving the size of the insect, compares it first with *V. urticae* and afterwards with *P. brassicae*. The largest I have seen are in the Doubleday collection, but they scarcely attain to either dimension.

G. papilionaria is too well-known an insect to call for the writing of its life-history again. Mr. G. J. Grapes has well recorded this in *Entomologist*, 1889, p. 110. The larva feeds upon birch, alder, hazel, and also, according to Stainton and St. John, upon beech. I do not understand Linné's "Habitat in *Tilia*." It may feed upon lime also. I have no information as to how or where the eggs are laid in nature. In captivity they are deposited singly or a few together. Mr. C. Fenn records that three batches which he observed took 5, 9, and 16 days respectively to hatch (*Entom. Rec.*, vol. iii., p. 175).

Like so many hibernating larvæ, these feed up slowly until the leaves begin to fall. In "Practical Hints" (*Entom. Rec.*, xiii., p. 162)

they are said to favour most low bushes. The time for hibernation having arrived, each larva spins a little pad of silk close to a bud, and there fixes itself by its claspers, remaining in an upright or slightly bent position all the winter. I have asked Mr. Newman, who is rearing a large number, if, during the mild spells of weather which have characterised this winter, his larvæ have been tempted to move or eat, and he replies, "No! the larvæ have remained still, they do not seem to leave their pads close to the buds." Instead of their green and brown coloration, they now assume a sober brown-black; owing partly to general darkening, and partly to a shrinking of the segments. This dull colour they retain until the first change of skin, after feeding in the spring. The wonderful adaptation of these larvæ to the changes of their surroundings has been often noted, and there is a particularly readable note on the subject by the Rev. G. M. A. Hewett, in the *Ent. Rec.*, vol. iv., p. 215. I have found it a very successful plan, when rearing these larvæ, to turn them out on the foodplant in autumn, of course in my garden, or where they may be easily found again, and to leave them to their own devices until they are well-grown, in the spring, though obviously they are thus subject to the possible attacks of ichneumons. I did not know why I was so much more successful when I followed this plan, until I found that when young, they have been observed to be particularly fond of the buds as food (Mr. E. A. Bowles, *Ent. Rec.*, vol. viii., p. 39, and "Practical Hints," *op. cit.*, vol. xiv., p. 55). Mr. Newman tells me that he is always careful that his young larvæ shall have a plentiful supply of buds in their bags during the hibernation period. The knowledge of this fact may be of value to any who have found a difficulty in rearing the insect from the egg.

The fullfed larva spins a few leaves of the foodplant together, forming a loose cocoon, in which to pupate. I have only one note as to the duration of the pupal stage. In 1887, a larva pupated on June 6th, and the moth emerged on July 5th. I should think this would be about the usual period. The moth, in nature, continues on the wing over a somewhat extended period. Mr. C. Fenn gives from the middle of June to the end of August (*Ent. Rec.*, vol. ix., p. 22). My own notes range from July 9th to August 3rd. I suppose a good deal depends upon the season.

G. papilionaria comes freely to light. Mr. E. F. Studd of Oxton, tells me that he takes the male commonly in his traps, but never a female, and it is stated that its visits to light take place very late at night (*Ent. Rec.*, vol. vii., 331). It also comes well to sugar. Mr. Baden Smith says that he took a male and female in this way (*Ent. Rec.*, vol. v., p. 17), and my own experience is that this method of capture is very successful in places where the species is tolerably common, the specimens thus taken being, as a rule, in finer condition than those taken by net or trap. I have not noticed at which hour the flight is most general, taking it perhaps for granted that the species began to move at dusk. It was, however, definitely stated at the meeting of the City of London Entomological Society on March 17th, 1896, that its true time of flight, is from 9 p.m. until very late. This I take to mean from dusk onwards.

The insect has a wide range. Staudinger and Rebel in their *Catalog* give "central and northern Europe (up to about 60–62° N. lat.), northern and central Italy, northern Asia Minor (*e.g.*, about Amasia

and Tokat), Armenia, Altai, Siberia, Amurland, Ussuri region *i.e.*, the coast region of Siberia, south of the Amur, about Vladivostock, Japan."

Of its range in Britain, Meyrick says "Britain to Ross." I have taken some trouble to verify this detail, and have to thank Mr. A. Horne for the following information: "I have never taken *G. papilionaria* actually in Aberdeenshire, but have found it across the Dee in Kincardineshire, also at Forres, in Elgin, in Morayshire, and Invershine in Sutherlandshire. This is one county further north than Meyrick gives. The blue-green specimen is from Rannock." Mr. Shortridge-Clark tells me it is not taken on the Isle of Man, and Mr. Richardson, that it is absent from Portland and Weymouth, where there is no birch. Mr. H. A. Beadle of Keswick, writes, "The only peculiarity I can find in the species is in its vertical distribution. I have taken it in a marsh 220 feet above sea-level, and also nearly to the top of a mountain, 1000 feet above sea-level, where a few birches grow beside a small brook." I may add to this information by recording that I took a specimen last summer, in my parish, at an elevation of perhaps from 10 feet to 12 feet above sea-level. But I am perhaps dilating too much upon points which are common knowledge, and must proceed without delay to that which is perhaps my own particular, and no doubt, to many, drier observations upon the early stages of the insect.

(To be concluded.)

Synopsis of the Orthoptera of Western Europe.

By MALCOLM BURR, B.A., F.L.S., F.Z.S., F.E.S.

(Continued from p. 181.)

FAMILY II.: ŒDIPODIDÆ.

This family, which includes those grasshoppers with coloured hindwings, is allied to the *Truxalidae*, but differs in the vertical frons, which passes over into the top of the head without making any angle; the foveolæ of the vertex are triangular and never contiguous in front; often they are absent. The form of the pronotum offers useful characters; the central carina may be entire or interrupted, and is sometimes raised into a compressed crest, or it may be cut or broken by the typical sulcus. The elytra have a characteristic venation; the scapular area has never regular reticulations; an intercalate vein is always present in the discoidal area; the wings are usually more or less brightly coloured, often with a characteristic black fascia or band, the posterior femora are compressed strongly and very thick; the species are usually fairly large and of stoutish build.

The family is divided into two subfamilies, which have been considered as distinct families by Brunner, but are now generally united. They are distinguished as follows:—

1. Frontal costa obtuse; posterior tibiæ with no external apical spine; second abdominal segment smooth . 1. ŒDIPODINÆ.
   1.1. Frontal costa compressed and sulcate; posterior tibiæ with an apical spine on the outer margin; second abdominal segment granulated .. .. 2. EREMOBIINÆ.

SUBFAM. 1: ŒDIPODINÆ.

Table of Genera.

1. Pronotum with a central keel throughout its length, entire, or cut by typical sulcus.
   2. Keel of pronotum entire; a depression on each side of keel; wings crimson, with black tips.. 1. Psophus, Fieb.
   2.2. Central keel of pronotum cut by typical sulcus.
      3. Inner half of elytra coriaceous; basal half of wings red, separated by a dark arched band from the apical half, which is transparent; apex dark .. .. 2. Quiroggia, Bol.
      3.3. Basal half of elytra less densely reticulated, not so coriaceous; wings hyaline or variously coloured.
         4. Central keel of pronotum deep, compressed.
            5. Pronotum with four yellow bands arranged in a cross; wings yellow, with a black arched band .. .. 3. Œdaleus, Fieb.
            5.5. Pronotum with two black longitudinal stripes; wings hyaline .. .. 4. Pachytylus, Fieb.
         4.4. Central keel of pronotum but little elevated, chiefly in metazona.
            5. Upper keel of posterior femora entire; wings with anterior part as far as apex, and sometimes part of outer border, dark .. .. 5. Celes, Saussure.
            5.5. Upper keel of posterior femora absent in apical half; wings of various colours, with a dark arched band distant from apex .. .. 6. Œdipoda, Latr.
1.1. Pronotum with no central keel, or with it incomplete, or with a central line not raised, and interrupted not only by typical sulcus, but also by the anterior sulcus.
   2. Alternate anal veins of wings strongly thickened, the transverse veinlets forming regular narrow areas .. .. 7. Bryodema, Fieb.
   2.2. Veins of wings normal.
      3. Central keel of pronotum extending from anterior border to posterior, but little raised, interrupted by typical sulcus; prozona about as long as metazona; hinder border of pronotum rounded or obtuse; body very hairy .. .. 8. Acrotylus, Fieb.
      3.3. Central keel of pronotum absent or imperceptible; metazona much longer than prozona, with hinder border rectangular or hardly obtuse-angled; not very hairy.
         4. Hinder femora with a large blue-black spot on inner face; metazona of pronotum nearly three times as long as prozona .. 9. Sphingonotus, Fie
         4.4. Hinder femora with no black spot on inner face; metazona one and a half times as long as prozona .. .. 10. Leptotettix, Sau

Genus 1: Psophus, Fieber.

The only species of this genus is easy to recognise by its st build, black colour, with deep crimson wings tipped with black.

1. Psophus stridulus, L.

Length of body, 23mm.-25mm. ♂. 30mm.-32mm. ♀; pronotum, 7·5mm. 8mm. ♂, 8·5mm. 9mm. ♀; of elytra, 24m 27mm. ♂. 18mm.-20mm. ♀. The female is stouter and larger th the male, and often of a lighter tint.

It is a mountain insect, occurring in many places in central Europe. It is known in Sweden and Norway and the north of Germany; in Belgium it is rare, being recorded from Lanaeken. In France it occurs in nearly every mountain in the country; it is found in all south Germany and Switzerland, in the Upper Engadine, and the Jura of Solothurn, Gyslifluh near Arau, Albis, Schnebelhorn, Bachtel, Glarus, Disentis, but not below 8-900 metres. South of the Alps it has been taken near Turin. In Spain it is found in the north and east.

GENUS 2: QUIROGESIA, Bolivar.

The single species is known by the dense venation of the basal half of the elytra and by the bright red wings with black band, outside which the apical half is hyaline, and the apex tipped with black.

1. QUIROGESIA BRULLÉI, Sauss.

Length of body, 23mm. ♂, 30-32mm. ♀: of pronotum, 4·8mm. ♂, 6·5mm. ♀; of elytra, 24mm, ♂, 20mm. ♀.

This handsome insect is rare; it is recorded from the south of Spain, at Seville; it also is found in Algeria and the Canary Islands.

GENUS 3: ŒDALEUS, Fieber.

This genus includes a number of species, all with yellow wings banded with black, that are widely distributed throughout the Old World. Only one species occurs in Europe.

1. ŒDALEUS NIGROFASCIATUS, de Géer (=*flavus*, Linn.).

Testaceous or green, varied with black; pronotum with four crossed yellow bands; wings yellow in basal half, with a broad arched black band. Exceedingly variable in size. Length of body, 18mm.-24mm. ♂, 30mm.-38mm. ♀; of pronotum, 4mm.-5·6mm. ♂, 5·5mm.-8mm. ♀; of elytra, 16mm.-27mm. ♂, 25mm.-34mm. ♀.

Common in central and southern Europe. In France it is common, occasionally occurring as far north as Paris; it is quite common throughout the west, centre and south. In Switzerland, it is found in Valais, and in Germany, Rudow records it as far north as Mecklenburg. In Austria it is found commonly at Oberweiden, also at Laierling, Brück, Neusiedlersee; also in the south Tirol. In Italy it is common, as well as throughout Spain and Portugal.

GENUS 4: PACHYTYLUS, Fieber.

This genus includes the true migratory locusts of the Old World (with the exception of *Schistocerca peregrina*, Oliv., vid. sub. *Acridiidae*). It is characterised by the compressed pronotum, with a blackish stripe on each side, and hyaline wings, faintly tinted with yellowish or greenish near the base. Two species occur in Europe, but one is practically confined to the eastern countries.

TABLE OF SPECIES.

1. Pronotum obtuse on fore border; the crest but little raised; ♂ about equal to ♀ in size; pronotum, seen from side, straight above, not tumid in prozona; hind tibiæ yellowish; larvæ with very broad black bands on pronotum .. .. .. 1. MIGRATORIUS, L.

1.1. Pronotum acute-angled in front; the crest strongly elevated; ♂ much smaller than ♀; prono-

tum, as seen from side, somewhat arched, a little tumid in prozona, especially in ♀; hind tibiæ reddish; larvæ often entirely green .. .. 2. DANICUS, L.

1. PACHYTYLUS MIGRATORIUS, L.

These two species are continually confused, and the collector must realise from the first that this species is a native of south Russia and the Levant, while the other species is far more widely distributed; the distinguishing points are set forth in the tables; the name *migratorius* is often wrongly applied to the following species.

Length of body, 35mm.-48mm. ♂, 42mm.-55mm. ♀; of pronotum, 8mm.-10mm. ♂, 9mm.-10mm. ♀; of elytra, 42mm.-54mm. ♂, 46mm.-56mm. ♀.

Rare in western Europe. In France, it has been taken at Sceaux, near Bordeaux and on the fortifications of Paris. It is quoted from Spain by the older authors, but Bolivar insists that it is *P. danicus* which occurs in the peninsula. The Alps prevent its extension into south and western Europe, but to the north of the barrier it pushes sometimes into Germany. In Belgium, it is recorded from Hesbaye in 1859, and from Longchamps in 1861, and it seems to have occurred in England, though almost all the references to this species are cases of mistaken identity. Strangely enough, it has settled, according to Brunner, at Schaffhausen, on the Rhine, where a somewhat small local race has developed. Otherwise, all records of this species in western Europe are accidental, or errors for the next species. It has been taken in Sicily, and extends eastwards to the Philippines.

2. PACHYTYLUS DANICUS, L. (=*cinerascens*, Fabr.).

Length of body, 29mm.-36mm. ♂, 37mm.-60mm. ♀; of pronotum, 7·5mm.-8·5mm. ♂, 9mm.-14mm. ♀; of elytra, 33mm.-40mm. ♂, 40 mm.-58mm. ♀.

This species is excessively widely distributed, ranging from Belgium to Japan and New Zealand. In Belgium, it is a true native, though not common by any means; it occurs at Campine, Munster, Deepenbaeck, Genck, etc. In England, it sometimes is found as a straggler, and perhaps occasionally breeds, as specimens have been taken in the New Forest in an apparently natural condition. In France, it is rare in the centre, but common in the south; localities worth mention are Agen, Paris, Fontainebleau, Arcachon, Metz and Francheville near Lyon. In Switzerland, it occurs in Valais and Vaud, and on the Thunersee, Rorschach-am-Rhein, occasionally numerous enough to do damage. In Italy, common at Pegli, Genoa, Savona, Voltaggio. In Spain and Portugal it is common throughout and is adult from August to October. It is recorded in Scandinavia from Upsala, Smaland, E. Gottland, Uppland (1748, de Geer), Yhlen (1843), Bråviken, Mem, and Slåtbacken, Vikboland, Skåne.

Lepidoptera of the Val d'Hérens—Evolène, Villa, Col du Torrent, Ferpécle Valley.

By J. W. TUTT, F.E.S.

I have already written considerably concerning the fauna of the Val d' Hérens (*antea*, xvi., pp. 146-149; xvii., pp. 1-6), and my few further notes are simply supplementary to show that the places already dealt

with do not quite cover all the collecting-ground of this lovely valley. On one visit in 1899, I spent ten days at Evolène, commencing on August 7th (the 8th and 9th wet), with Dr. Chapman, and worked steadily all around the village. Except for a good walker though, Evolène is too low for really good collecting in August, and as, at the time of my visit, I was too unwell to climb, I found my bag rather limited. A footpath from the village down to the river was a favourite walk, and here, at the puddles, *Polyommatus damon*, large and fine, but with rather small spots on the underside, *P. corydon*, *P. astrarche*, scarcely a ♀, *P. escheri* (only ♂s), *Pamphila comma* and *Syrichthus alveus* were particularly abundant, whilst smaller numbers of *Plebeius argyrognomon* (*argus*) and *Nomiades semiargus*, the latter in specially fine condition (both sexes) were observed. By the roadsides, too, *Issoria lathonia* in first-class condition, *Chrysophanus virgaureae*, *Epinephele lycaon*, and *Coenonympha pamphilus* were not uncommon, whilst *Pararge maera*, *Aglais urticae*, and *Pyrameis cardui* were also abundant, *Epinephele ianira* being much less common than *E. lycaon*; *Brenthis ino* and *B. amathusia* were both going over, and *Melitaea phoebe* quite washed out. On the other hand, *Polyommatus icarus*, *Cupido minima* (very small), and *Thymelicus lineola* were in fine condition. *Erebia goante* was the commonest *Erebia*, and very fine the specimens were, whilst it came with *Polyommatus eros* to the damp spots in the grounds of the Hotel de la Dent Blanche; *Argynnis niobe* was the most abundant of the larger fritillaries, both type and var. *eris*, although *A. aglaia* was also common, but *A. adippe* was scarce and worn. Among the *Syrichthus alveus* were three beauties, black, with clearly cut white markings, with one late, worn *S. carthami*. Although *E. lycaon* was so abundant the males were going over by August 10th, at which time, however, the ♀s were in splendid condition. Of the specimens of *Polyommatus icarus*, most of the examples had one or other of the basal spots on the underside of the forewings, as usual, absent. The females of *Pararge maera* were also particularly fine. *Euvanessa antiopa*, just emerged, was seen once or twice, the earliest on August 14th, at which time a large brood, from larvæ taken at Fusio, was emerging in the hotel; larvæ of *Papilio machaon*, *Saturnia pavonia*, and *Hemaris tityus* (*bombyliformis*) were also frequently picked up, as well as imagines of *Dasydia obfuscata* and *Gnophos glaucinaria*, whilst *Papilio podalirius*, *Coenonympha* var. *darwiniana*, and other species were also frequent. In one or two places there was an abundance of *Melanargia galatea*, unfortunately worn, *Hipparchia semele*, and two or three *Limenitis camilla* were noted; *Erebia ceto* also was going over, and in poor condition. One ♀ *Gonepteryx rhamni* was seen, and two *Colias* var. *helice* on the 11th.

One of the most productive little walks here is up to Villa, a village of some 5600 feet elevation. Passing a short distance along the road towards Haudères, one turns off sharply to the right by an easily overlooked little footpath, and immediately starts ascending the zigzags that run up to the village. On these slopes, the larvæ of *Hyles euphorbiae* were on the move, on August 10th, in amazing abundance, from little ones just hatched to huge fullfed creatures, stretched out over the foodplant, enjoying the sun which had been absent for the two preceding days. Few insects were seen on the way up, probably because it was too early, but, when we got beyond the village for some distance, insects became abundant enough, and, at last,

we came to a rough piece of waste land that opened into a sort of gully, running apparently almost directly up to the Col du Torrent above, and was continued down to the cliff that here forms the boundary of the Val d'Hérens on its eastern side. Possibly no finer piece of unbroken alpine pasture land, leading directly from a height of 5700 feet to the skrees and rocks above at 10000 feet, could be imagined, and here, as a matter of fact, the highest alpine species with a few strokes of their powerful wings can fly from the upper levels, and may occasionally be found mixing with the natives that swarm in the chosen corners of the lower levels, and thus *Brenthis pales*, *Colias phicomone* and *Cleogene lutearia* were to be found with *Brenthis ino*, *Issoria lathonia*, *Pararge maera*, *Epinephele ianira*, *E. lycaon*, *Erebia aethiops*, *E. euryale*, *E. stygne*, *Melitaea athalia*, *Polyommatus corydon*, *P. damon*, *Syrichthus alveus*, *Vanessa io* and *Colias hyale*. On the scabious here, by turning over the leaves, larvæ of *Hemaris tityus*, and on the *Galium*, larvæ of *Semia stellatarum*, could be easily found, whilst those of *Arctomyscis euphorbiae* var. *montivaga* were also observed. On the sallows growing in the lower part of the gully, larvæ of *Cerura vinula* and *Clostera pigra* were in some numbers, whilst, on the particular morning noted (August 10th), the walk down the zigzags in the full glare of the sun at noon was something to be remembered. The thistle-flowers were teeming with insect life, and one could only choose the best of the insects as one passed, a difficult matter even then, because of the abundance of some of the species—*Epinephele lycaon*, *E. ianira*, *Erebia stygne*, *E. ligea*, *E. melampus*, *Chrysophanus virgaureae*, *C. hippothoe* (worn), *Thymelicus lineola*, *Pamphila comma*, *Polyommatus eros*, *P. corydon*, *P. escheri*, *P. damon*, *P. hylas*, *P. astrarche*, *Coenonympha* var. *darwiniana*, *Argynnis niobe*, *A. aglaia*, *A. adippe*, *Pyrameis cardui*, and *Vanessa io*. Among the *C. virgaureae*, was one very suffused, almost uniformly dusky, whilst *P. corydon* of obsolete form on the underside, were not uncommon. The silver-spotted form of *Argynnis niobe*, as well as var. *eris*, was not uncommon. *Adscita geryon* was the only "forester," and *Anthrocera achilleae*, the only Anthroceri considered worthy of capture; several *Lithosia lurideola* were on the flowers, and *Eubolia bipunctata* was disturbed in great numbers.

(To be concluded.)

Notes on collecting in Egypt.

By (Rev.) O. PICKARD-CAMBRIDGE, M.A., F.R.S., &c.

Mr. P. P. Graves' paper on the above subject (in *Ent. Record*, June 15th, 1905) has interested me much, as, certainly in respect to lepidoptera, my experience many years ago seems to have been pretty much what his was now recently. Mr. Graves gives no list of the species, or number of species, approximately, that he met with—nor have I ever done so, in fact, excepting the Micros and a few others, mine have never been properly worked out. There are rather over 100 species in all. The time when they were captured was from January 18th to April 27th, 1864, and the ground worked over was from Alexandria to Assouan, during the usual routine of a Nile trip in a Dahabeah. My principal attention was paid to Arachnida (spiders, &c.), but I collected all orders of Insecta—coleoptera and hymenoptera being, in the result, the most numerously represented. Excepting the lepidoptera, I retained none of the Insecta, all the best having

been placed in the hands of the successor to Mr. Samuel Stevens (Mr. Higgins) for disposal to whomsoever the specimens might be of any value. Among the lepidoptera worked out (shortly after my return to England in 1866), by Professor Zeller, were the following, which he described and figured as new to science: *Simaethis aegyptiaca*, *Schoenobius niloticus*, *Eromene cambridgei*, *Pempelia psammenitella*, *Nephopteryx scabida*, *Nephopteryx isidis*, *Ephestia cahiritella*. In what publication these new species were recorded I forget*. I was not able to obtain a copy of it, but the types of the species are in my possession. Among the Diurni were four or five species of "tinted blues," besides *Lampides boeticus*. I also bred some fine specimens of *Danais chrysippus* (among them one with nearly white hindwings), the larvæ of which fed upon some plant (I think) of the spurge kind. If I had only been bent upon lepidoptera it would have been dull "entomologising;" indeed, whole days would pass without the addition of a single species to the collection, but 164 species of spiders made up for other differences. Looking, at long intervals, at my unworked-out Egyptian collection of lepidoptera, I have sometimes wondered what might be the output of those desolate regions if worked especially for that order, and at, perhaps, a more favourable time of the year. It would be interesting to see a full list of Mr. Graves' results; meantime I must try and get the remainder of my own collection worked out.

Linné's genus Papilio and its subdivisions—Barbut's types of these subdivisions when used in a modern generic sense.

By J. W. TUTT, F.E.S.

It is generally recognised that Linné included (*Systema Naturae*, etc., xth ed. and xiith ed.) the whole of the butterflies in one genus, the genus *Papilio*, and that the rest of his classificatory names have no nomenclatorial or classificatory value *per se*. This is, so far as we understand the matter, the position taken up by Scudder and others. That Linné had almost as clear a conception of the main divisions into which the butterflies fall as we have at the present time is evident, from the subdivisions that he created. This is readily seen by the Linnean subdivisions, which, in the xiith edition, are as follows:—

Genus: PAPILIO.

EQUITES.
Troes.—P. E. T. priamus, hector, paris, &c.
Achivi.—P. E. A. podalirius, machaon, &c.

HELICONII.
Heliconii.—P. H. cratægi, apollo, mnemosyne, &c.

DANAI.
Candidi.—P. D. C. rhamni, brassicæ, rapæ, &c.
Festivi.—P. D. F. plexippus, misippus, hyperantus, &c.

NYMPHALES.
Gemmati.—P. N. G. io, megæra, galathea, &c.
Phalerati.—P. N. P. populi, antiopa, uritcæ, paphia, &c.

PLEBEII.
Rurales.—P. P. R. betulæ, arion, phlæas, &c.
Urbicolae.—P. P. U. comma, malvæ, tages, &c.

In 1781, Barbut, an English author, in his advanced work (*Genera Insectorum of Linnaeus*, pp. 160 *et seq.*) maintained the *term* "genus," as used by Linné, but he applied to all Linné's lower sections modern generic values as follows:—

* In the *Stett. Ent. Zeitung*, 1867, pp. 384 *et seq.*—Ed.

Genus: PAPILIO.

EQUITES.

Troes.

Tros *example* P. E. hector, Linn., no. 2.

Achivos.

Achivus *example* P. E. A. machaon, Linn., no. 33.

HELICONII.

Heliconii.

Heliconius *example* P. H. cratægi, Linn., no. 72.

DANAI.

Candidi.

Danaus-Candidus *example* P. D. C. rhamni, Linn., no. 106.

Festivi.

Danaus-Festivus *example* P. D. F. hyperantus, Linn., no. 127.

NYMPHALES.

Gemmati.

Nymphalis-Gemmatus *example* P. N. G. io, Linn., no. 131.

Phalerati.

Phaleratus *example* P. N. P. urticæ, Linn., no. 167.

PLEBEII.

Rurales.

Ruralis *example* P. P. R. betulæ, Linn., no. 220.

Urbicolae.

Urbicola *example* P. P. U. comma, Linn., no. 256.

In his English parallel to this scheme he simply notes the "Genus Papilio" as the "Genus Butterfly," *i.e.*, the "butterfly kind" (of lepidoptera), or, as we might put it in current English, "Butterflies." This was Barbut's opinion evidently 124 years ago of what Linné meant by "Genus Papilio"; it is mine to-day. In our modern use of the term genus it appears that Barbut's application of *Tros*, *Achivus*, *Heliconius*, *Danaus-Candidus*, *Danaus-Festivus*, *Nymphalis-Gemmatus*, *Phaleratus*, *Ruralis* and *Urbicola*, with the "example," *i.e.*, "type," cited from Linné's work, fixes the Linnean names and their types exactly in the sense of modern genera. This view is quite apart from any consideration of the compound form of some of the names, which were kept separate by Linné, and which I would separate as coequal generically with sectional types, retaining the name last used by Barbut, with the type declared, *e.g.*, *Candidus* type *rhamni*, *Festivus* type *hyperantus*, *Gemmatus* type *io*, just in fact as separated by Linné, and leaving *Danaus* and *Nymphalis* free for other groups of *Candidi* or *Festivi* and *Gemmati* respectively.

This is not intended to open the door for another discussion on synonymy, for which we have no space, but I should be glad to have any thoughts on the matter, privately, from lepidopterists who have a knowledge of entomological literature, as it is proposed to bring out a new work on British butterflies, and my researches so far lead me to think that Scudder and the later authorities on our butterfly names, have either missed many important works, or have acted very arbitrarily in their selection of names.

NOTES ON COLLECTING, Etc.

HYLOICUS PINASTRI STILL IN SUFFOLK.—I have just been partially successful with *Hyloicus pinastri* at Aldringham, near Aldeburgh, and have been much interested in reading your exhaustive account of this species in vol. iv of *British Lepidoptera*. I went over on Whit-Monday, and stayed Tuesday at Aldeburgh, and did a little harmless trespassing on Mrs. Ogilvie's fine plantations at Aldringham, resulting in the find-

ing of one worn female, one worn male, and, at 4 p.m. (June 13th), a small female drying its wings at the root of a pine. This had apparently found emergence (through grass or gorse roots) somewhat difficult, and, though the wings were all right, the body, thorax, and head, were all partially denuded of scales. It seems extremely early for rubbed and worn specimens. Other interesting finds were what appeared to be a larva of *Malacosoma castrensis*, a freshly-emerged female of *Panolis piniperda*, and a three-quarter grown larva of the same species, illustrating the vagaries of the season (as some fullfed larvæ were taken here yesterday). I should much like to try the experiment of introducing *H. pinastri* into excellent pine-woods on the north side of Norwich, far finer than where the species now occurs, and where it seems to be quite out of place, pine-woods by no means predominating there. If such an experiment were to succeed, it would still further support the evidence that it is not indigenous to Britain, and that it has either flown over and established itself, or has been introduced by human agency in the Aldeburgh district. A second visit to Aldeburgh, on June 20th, resulted in my taking four more *H. pinastri*, whilst three others were taken by another clergyman in the previous week. Three were well marked, one male especially so, with many extra dark marks, one male hopelessly worn. I ruined one female in the fruitless attempt at "sembling," and the worn male would not act. I spent many hours in searching all the pines in the most favoured plantations, morning, afternoon, and before dusk, at which latter time I got the two freshly-emerged specimens, on trees which were barren when searched earlier in the day, but there were evidently very few others about, as I saw none on the wing. I, moreover, tried honeysuckle after dark without avail. I also failed to find even the empty pupa-cases at the favoured trees, though I dug most carefully all round the roots for about a foot. Doubtless they had pupated further afield, and had crawled back to the tree for the drying process. On this visit too, I amply confirmed the presence of *Malacosoma castrensis* at Aldeburgh. I went particularly to the sandhills first to find this, and it was, indeed, pleasant in the cool of the evening to stroll leisurely about and pick up a dozen the first evening. Some were feeding on the narrow-leaved plantain, but most were lying stretched out at full length on grass-stems. The next day I searched again, but only found two, in the same place, lower on the herbage. In the evening, at 7 p.m., I continued the hunt, and at length came across their head-quarters, *viz.*, over the sandy lane at Thorpe, near Aldringham, and right on the salt-marsh. Here they were in any quantity, some half-grown in nests, and many more large and full-grown, spotted about on the top of grass- and reed-stems all over the place, and most conspicuous even at a distance of twenty or thirty yards. I was very pleased with my find.—(Rev.) A. Miles Moss, M.A., The Upper Close, Norwich. *June 18th*, 1905.

Plan of trapping Cerurid and other larvæ.—A very successful plan for trapping the larvæ of the "kittens," and other species, that I have practised, is to pull off large pieces of loose bark from old trees and nail them closely to those on which I knew larvæ of *Cerura furcula*, etc., to be feeding. I place these on the north and east sides, chiefly about thirty inches from the ground. In some cases, where I have also tried the damp side, I have found nothing but woodlice, earwigs, spiders, &c.

I should add that, before applying the bark, I cleaned it carefully of all eggs and cocoons. I have found an old pair of dental forceps very useful, both for stripping the trees of the bark and for hammering it on the others. On one occasion, I took 56 cocoons of *Cerura furcula* from six trees thus prepared, and long series of *Earias chlorana* and *Hypsipetes ruberata*. I went to fetch the pupæ about October or November. Perhaps if I had waited till spring I might have also found larvæ of *Apamea unanimis*.—T. CASSAL, Brook Villa, Ballaugh, Isle of Man. *June 26th*, 1905.

CALOPTERYX VIRGO, LINN., IN LANCASHIRE.—On June 15th, while walking from Lakeside, Windermere, to the Ferry Hotel, I saw two males and one female of this beautiful insect flying about and settling upon the ivy which clothed one side of a bridge carrying the road across a broad stream. I send this record as this county is not among the localities given for it in Mr. Lucas' book, *British Dragonflies*.—OSCAR WHITTAKER, 39, Clarendon Road, Whalley Range, Manchester. *June 21st*, 1905.

ERRATUM.—ERRONEOUS RECORDS OF EREBIA SCIPIO.—Ten years ago, when I was quite a beginner at European Rhopalocera, I early got a confusion of names (not insects) in my mind between *Erebia scipio* and *E. stygne*, and it is remarkable that, well as I know the species at the present time, I find myself even now frequently writing the one name for the other. Two blundering records occur through this—one *Ent. Rec.*, ix., p. 203, the other *Ent. Rec.*, xi., p. 198, the species being *E. stygne* and not *E. scipio* in both cases. These ought to have been corrected long ago, and I owe my humble apologies to all those that my stupidity has misled in the matter. The only locality where I have taken *Erebia scipio* was at Larche, in 1900.—J. W. TUTT.

SPRING LEPIDOPTERA.—It was between the seasons when I arrived at Hyères. The earliest spring butterflies—*Thestor ballus*, *Callophrys rubi*, etc., were quite over, and their followers—*Melitaea aurinia*, *Syrichthus sidae*, *Melanargia syllius*, had not appeared—yet, considering all things, and, beyond all, the unsatisfactory weather in England during Easter week, there was much to be thankful for, and when, on April 24th, I first unfurled the net, on the little road leading along to the quarries at Costebelle, where the roses hung in garlands along the hedges, and festooned every tree, in cream and white, I felt that I had escaped something, and that there was much to be said in favour of the sun-worshippers. Entomologically there was not much doing, *i.e.*, much for Hyères, although one would have considered it very nice, and nearly first-class, even in June for Britain. *Pontia daplidice* and *Anthocaris belia* still flew, some in fine condition, although some larvæ of the latter were already nearly full-fed on the *Biscutella*; *Pieris rapae* and *P. brassicae* were very abundant, and *Leptosia sinapis* fluttered along the wood-riding further on. *Thestor ballus* was in shreds, but *Polyommatus bavon*, *P. astrarche*, *P. icarus*, *Nomiades cyllarus*, and *N. melanops* were pretty frequent, and several good ones were taken; *Chrysophanus phlaeas* was none too good, whilst *Callophrys rubi* was very abundant, but quite *passé*. The appearance of *Euchloe euphenoides* was a great pleasure, although only two ♀s were taken, as against quite a score of ♂s, of which most were of good size, only two being small and below the average. The orange-coloured eggs were exceedingly plentiful on the flowers of *Biscutella*, making one surprised that

♀ s were not more abundant. *E. cardamines*, on the other hand, was rare, but *Pararge megaera* was common and poor in condition, but *Pyrgus sao*, *Syrichthus alveus*, and *Acontia luctuosa* were only just appearing. An immigrant band of *Pyrameis cardui* appeared to have recently come over, mostly large pale ♀ s that were intent on egg-laying almost everywhere. The joy it was to see *Gonepteryx cleopatra* banging up the wooded slopes again, poor as the ♂ hybernators had now become in condition, only those who have watched this insect can imagine, whilst the ♀ s were still full of eggs, and often seen busily inspecting the buckthorn bushes, and, in one opening on the edge of the wood, there were plenty of freshly emerged *Melitaea cinxia*. Crossing the ridge, and working through the woods in the direction of Carqueiranne village, with the Mediterranean fully in front, a good many insects were observed, and, besides *Sesia stellatarum* and *Hemaris fuciformis* busily at the flowers, we found a spot where a few *Thais medesicaste* were still in fair condition, but I got no eggs, and here I put up a ♂ of *Arctia villica*. The afternoon, however, came over somewhat dull, and, with the exception of a few more *E. euphenoides* on the way down to the road, the work came to an end. The next day, April 25th, I walked up the Castle Hill, and on across the lavender-covered slopes to the farm in the hollow, the historical Plan du Pont. It was a glorious sunny day, and the common Pierids were in great numbers. I am afraid I did not see many species, but the net was busy all the day, and, down in the hollow, two lovely series were obtained—one a long series of fine big *Brenthis euphrosyne*, the undersides yellow, and reminding one of *daphne* in the basal areas, and approaching it in size, the other a fine lot of *Melitaea cinxia* of large size and excellent colour. *Brenthis dia* was also abundant, but getting worn, one bright large ♀, however, being the largest I have ever seen. Hybernated *Gonepteryx cleopatra* were very abundant, especially the females, one or two lovely *Limenitis camilla* were the forerunners of those that Mr. Sheldon saw here in abundance a week or so later, whilst a couple of splendid *Pararge egeria* were possibly late specimens of the early brood. *Euchloë cardamines*, both sexes, were not uncommon, but mostly worn, whilst, on the grassy banks, *Nomiades cyllarus*, *Polyommatus icarus*, *Coenonympha pamphilus*, *Syrichthus alveus*, *S. malvae* var. *melotis*, *Pyrgus sao*, *Urbanus* (*Carcharodus*) *alceae*, *Fidonia atomaria*, *Acidalia ornata*, and *Acontia luctuosa* were captured in small numbers. *Thais polyxena* was quite over, a few colourless ♀ s only observed, and the young larvæ were already a good size. Further on, towards the farm, where *M. cinxia* became very abundant, a single freshly-emerged *Polyommatus corydon* ♀, and one bright *Melitaea phoebe* were captured. On the slopes behind the castle, on the way there, a few freshly-emerged *Pontia daplidice*, and one or two worn *Anthocaris belia* had been taken, whilst on the lavender flowers two brilliant green Adscitids, at present referred to *Adscita statices*, the same insect that occurs at Auribeau, near Cannes, and here and there a specimen of *Hemaris fuciformis* buzzed busily at the same flowers. It was noticeable what a large percentage of ♀ *M. cinxia* could be captured in the afternoon compared with ♂ s, this sex being quite rare earlier in the day. Calling on Mr. Powell in the evening, I found he had cycled to Montrieux monastery, where he had taken *Leptosia duponcheli* among other good insects. The next morning, April 26th, was equally fine, and so about 9 a.m. a start was

made, by the little omnibus, for Carqueiranne. This visit was a huge disappointment. The early spring insects were quite gone, except for a few *Pontia daplidice* and *Anthocaris belia*. Every year the ground here available for collecting appears to be lessened, and somehow insects expected were unexpectedly late, and I only saw five examples of *Melitaea aurinia*, all males. *Pararge megaera* was in good condition, the ♀s large, the first brood of *Issoria lathonia* scarce, the specimens very small, as usual, whilst I was much disappointed in finding *Nomiades melanops*, *N. cyllarus* and *Polyommatus baton* going over, very few being really in fine condition. Occasional specimens of *Pyrgus sao*, *Nisoniades tages*, and *Urbanus alceae* were taken, and *Leptosia sinapis* and *Euchloe cardamines* were frequent; a fine lot of *Euchloë euphenoides*, mostly ♂s, and four of them very small, were taken, whilst *Melitaea cinxia* was here also the most abundant species. A few *Acontia luctuosa* about completed the bag. We saw *Papilio podalirius* and *P. machaon*, and captured several, but only one of each worth a pin, whilst only one worn *Thais medesicaste* was observed. About 1.30 p.m. the weather clouded over, so, after collecting a few larvæ of *A. belia*, from which to breed the early summer brood, *ausonia*, we returned to the hotel to get on with the setting. Although August 27th, was another pretty fine day, the difference between this and the 25th at the Plan du Pont was remarkable, fewer examples of almost everything being on the wing; perhaps the wind affected the insects, at any rate I got no species except *U. althaeae* that I had not already taken, and many that I had seen on the first visit I did not get at all. I was particularly disappointed in not getting any *Syrichthus sidae* and *S.* var. *melotis*. A glorious morning on the 28th led me again to go to the Pont du Plan for *Syrichthus sidae*, but to no purpose. The previous day had shown a marked falling off in the captures, and, as I have said, I was very disappointed in getting no more *S. malvae*, the southern type of which, occurring here, appears to be the form *melotis* of Duponchel. On the Castle Hill to-day, however, a great change was observable. Not only was *Melitaea cinxia* in very great abundance, but *Acontia luctuosa* had come out with a burst, and was in the loveliest possible condition. Some fresh *Papilio machaon*, too, were about, and *Pyrgus sao* was flying freely. I was surprised, considering the poor condition of the few odd specimens of *Thais polyxena* I had hitherto seen, to get a magnificent ♀ of this species on the Hill. *Hemaris tityus* and *H. tityus* were both on the wing, the former getting into poor condition, whilst *Coenonympha pamphilus* was also abundant, but the great change was in the Micro-lepidoptera—but to name them off-hand is risky. *Aciptilia tetradactyla*, several freshly emerged, only one seen the previous day; a specimen of *Oxyptilus distans*, I searched for more but evidently it was only just appearing; also only a single specimen of a species of *Coleophora*: *Catoptria*, a species near *cana*, but much brighter, and a *Phoxopteryx*, rather like, but larger and darker than, *siculana*, and two or three other species of Tortricids, whilst among the Geometrids, *Acidalia ornata*, *Asphalates citraria*, *Acidalia rubricata*, *Acidalia marginepunctata*, *Zonosoma papillaria*, and several *Adscita statices*. Down in the hollow, *Syrichthus alveus* was frequent, and another very fine specimen of *Urbanus althaeae* was taken; *Chrysophanus phlaeas*, in good condition, all those taken on the preceding day were worn, but very few of the *Brenthis euphrosyne*, *B. dia*,

[illegible] *cardamines* were worth pinning. Tiny *Issoria lathonia* [illegible] occasionally noticed, and *Gonopteryx cleopatra* were still abundant, [illegible] the hybernated ♀s still in very fair condition, and more [illegible] feeding than egglaying, the bodies quite plump, whilst, at the same time, larvæ were getting of fair size. There is no doubt that hybernated *G. cleopatra* are on the wing and egglaying quite up to the time that the earliest emergences of the year take place in June. *Issoria lathonia* were in lovely condition, all males, however, yet, as these were very wary and chose the bushes by the side of a ditch, where they were most difficult to reach, and, as a result, I did not capture a single one. I saw, *Leptosia sinapis*, *Pieris napi*, and *Polygonia c-album* were frequent enough, and single specimens of *Vanessa cardui*, *Pyrameis atalanta*, and a fine ♂ *Colias edusa* were [illegible] the latter species that had not been worn to shreds, about *Papilio machaon*, frequently, and *Lycæna icarus* and *L. astrarche*, males, passed past, as also did *Colias edusa*, but the spring brood of these species was distinctly over. The next morning was dull, and a search in Carpenter ravine produced nothing better than a few *Lycæna icarus*, *Melanargia galathea*, *Polyommatus phlæas*, *Strymonidia w-album*, and *Acontia albimacula*. *Hesperia sertorius* appeared to be abundant. A search for *Anthocaris cardamines* was successful, but rain threatened and we unfortunately returned to Hyères, for the late afternoon turned out bright enough. The next day, April 30th, was also spoiled by want of sunshine. On this occasion Mr. Powell took us to a very good looking locality, near La Valette, and whilst the sun lasted *Euchloe euphenoides*, *Pontia daplidice*, *Pelopidas mathias*, *Nemadus cyllarus*, and *Melitæa cinxia* were to be taken, the first named somewhat freely, not long before noon, and when we had worked round and up to that ground that Mr. Powell wished to reach, the sky was quite clouded over. A short [illegible] sunshine later started *Melanargia galathea*, of which Mr. Powell captured three, showing that we might have expected to do well, had it remained bright. A single ♂ *Melitæa aurinia*, and the *Lycæna icarus* were the only other butterflies worth noting. Close [illegible] among the herbage for a short time produced *Ichnodava cinxia* [illegible] very much worn, *Herbula cespitalis*, *Phycis* sp., *Strymonidia w-album* and *Acrylitia tetradactyla*. On the way to the town in the morning we had seen the lovely *Lactrodectus 13-guttatus* flying freely by the roadside. May 1st was to be our last day at Hyères, but my daughter was ill, and we only reached the heights behind the castle, where we hoped to get *Melanargia galathea*, but it did not appear. *Acontia luctuosa* and *Melitæa cinxia* were, of course, still more abundant as were also *Rhodaria sacrarialis*, *Pyrausta rosalis*, *Herbula cespitalis*, &c., but I was much astonished to find both *Lycæna icarus* and *Anthocaris belia* flying very freely, two species that I had not observed before in abundance in the spot. They were newly in fine condition, quite fresh, but appeared to be of the spring and not the summer form. The next morning we left for Dragignan. J. W. Tutt. 119, Westcombe Hill, S.E.

COLEOPTERA.

Calosoma sycophanta in Guernsey. I have just had a fine specimen of the rare and handsome *Calosoma sycophanta* brought to me. This makes the third specimen I have seen captured in Guernsey.

during nearly forty years' collecting.—W. A. LUFF, La Chaumière, Brock Road, Guernsey. *June 25th*, 1905.

SCIENTIFIC NOTES AND OBSERVATIONS.

PROTECTIVE RESEMBLANCE OF PUPA OF PIERIS BRASSICÆ TO LICHEN.

Near the coast of North Devonshire, at the end of April last, I came across a pupa of *Pieris brassicae* attached to the trunk of a tree that was much covered with rough lichen. The resemblance of the pupa to the lichen was marvellous—protective resemblance could not have been carried further. The jagged contours of the pupa had much to do with this, as well as the coloration and markings. I may add that an entomological friend was with me at the time, and, though I took him up to the tree and told him to look there for a pupa of *P. brassicae*, he failed to detect it. Yet I watched his eye pass over the creature more than once. SELWYN IMAGE, M.A., 20, Fitzroy Street, W. *July 3rd*, 1905.

CURRENT NOTES.

At the meeting of the Entomological Society of London, held on June 7th, 1905, Dr. Karl Jordan communicated an important note upon the "Variability of the Genitalia in Lepidoptera." He observed that, for a long time, it was the opinion of systematists that the organs of copulation in insects were practically constant within a species, and that, therefore, a form of insect which was found to be different in these organs was considered to be a distinct species. He demonstrated about ten years ago in the lepidoptera, and has done so on several occasions since, that there is a certain amount of individual variability in the organs of copulation, and that this variability is independent of the variability in other organs, for instance, in the wings. Individuals which are aberrant in pattern may be normal in the copulatory organs, and specimens with marked deviation from the typical in these organs have normal wing-patterns. Dimorphism in the wings, so strongly marked in many lepidoptera, is not accompanied by differences in the organs of copulation. On the other hand he has found that there is often a more or less marked geographical variability in the organs of copulation accompanying variability in the wings, a geographical variety of a butterfly or moth being, in most cases, characterised by some distinction in the wing and the organs of copulation. The bearing, on the evolution of species, of this contrast of geographical and non-geographical variation is obvious. It appeared to him easy to understand why the specimens of the same locality, which copulate together, are on the whole the same in the organs of copulation, but it is more difficult in the case of seasonal varieties. If the causes of seasonal variation have anything to do with the origin of new species, one should expect that seasonal forms, which are often so very different from one another in the wings, would also be different in the organs of copulation. He has examined many seasonally dimorphic species without result. Lately, however, he had come across a solitary instance of seasonal variability in the organs of copulation. The spring form of *Papilio xuthus* is slightly but distinctly and almost constantly different from the summer form in the 'harpe' of the clasper, the dentate portion of the 'harpe' being

proportionately longer in the summer form than in the specimens of the spring brood. This case of variability, he observes, is of importance for the systematist as well as the evolutionist. It disposes of the opinion still held by many systematists that a form with some distinction in the organs of copulation is a species, and it demonstrates at the same time that a species can be split up by natural causes into forms which differ morphologically like species, in organs of such importance for the preservation of the species as are the organs of copulation. This view is important, but facts are wanting to demonstrate the point satisfactorily. Edwards has suggested (*Trans. Zool. Soc. London*, xiv., p. 160, pl. xxiii., figs. 27-27*a*) *malvoides*, as a species distinct from *Syrichthus malvae* on this ground, and it would be interesting to know how many specimens examined exhibited these genitalic characters, how far when put together, they agreed with and differed from ordinary *S. malvae* from the same districts in general form, wing-markings, and other characters. Then there is the work done by Grote and Smith. We have a reference to this in *British Noctuae and their Varieties*, iv., pp. xvi-xvii, *re Graphiphora augur* and *G. haruspica*, and Grote's detailed discussion of the subject relating to Noctuids, Hesperiids, &c., in the same work, pp. xvii-xviii. It is, indeed, quite time that a summary of work done in this direction was published. There are many interesting facts in Giard's "La Pœcilogonie" (*Bull. Scientif. de France et Belgique*, xxxix., pp. 153 *et seq.*) that we received from the author only today (July 4th), bearing on the same and similar points.

A meeting of the Entomological Club was held on June 27th, at "Stanhope," The Crescent, Croydon, when Mr. T. W. Hall was the host. A large number of members and friends were received by Mr. and Mrs. Hall, and, after tea had been served, the beautiful evening was spent on the lawn in informal discussion of matters entomological and otherwise. An excellent supper was served at 8.30 p.m., when the following among others sat down—Messrs. R. Adkin, A. J. Chitty, J. E. Collin, W. Distant, H. St. J. K. Donisthorpe, S. Edwards, A. Harrison, W. J. Kaye, H. Main, A. Sich, E. Smith, R. South, E. Step, H. J. Turner, J. W. Tutt, G. H. Verrall. Some time was then spent very pleasantly gossiping, until the southeast contingent had to leave about 10.30 p.m. for London Bridge, the west-end party staying some time longer before they started on their return journey. Mr. and Mrs. Hall are to be congratulated on providing such a pleasant evening for their entomological friends.

There was a large and brilliant assemblage in the Sheldonian theatre, at Oxford, on Thursday morning, June 29th, and among the many present the Entomological Society of London was well represented to witness the ceremony, and to applaud Engineer Commander J. J. Walker, R.N., one of the secretaries, upom whom the Convocation was to confer the honorary degree of Master of Arts, in recognition of his services to entomological science. The gallant Commander was introduced in a brief Latin speech commemorating his achievements in naval science, and in the peaceful fields of entomology, especial stress being laid upon the work done by him in the order of coleoptera. Among those who had come to congratulate the recipient of an honour, which should be especially gratifying to all lovers of entomology, we noticed Professor E. B.

Poulton, F.R.S., Fellow of Jesus College, in the scarlet robes of a doctor of science, Dr. F. A. Dixey, Bursar of Wadham College, in the red robes of a doctor of medicine; and among the M.A's. Mr. H. Rowland-Brown of University College. Mr. G. C. Champion, F.Z.S., had also come down from London to represent, with his colleagues, the Entomological Society, which has found so many valuable and energetic Fellows among the graduate and undergraduate members of the University of Oxford.

The British Association, about a thousand strong, sails for the Cape this day (July 20th). Among the Associates who are to enjoy the hospitality of the South African Colonies, we notice the names of Professor Poulton, F.R.S., F.E.S., who will deliver an address in Cape Town, and Dr. Longstaff, M.D., F.E.S., who is an active observer and collector all over the world.

Mr. Roger Verity observes, in a circular that we have just received, that the increasing difficulty of procuring the rare and costly works and the innumerable publications in which the literature relating to the Palæarctic butterflies has been dealt with, has led him to contemplate publishing another work on the species which shall unite all the information obtainable on the species. If he is really about to give us all the life-history details relating to the Palæarctic butterflies that lie buried on the *Stett. Ent. Zeitung*, the *Berl. Ent. Zeitschrift*, the *Wien. zool.-bot. Gesellschaft*, the French *Annales*, the Belgian *Annales*, &c., to say nothing of the Dutch, Russian, Italian, Scandinavian, and other German magazines, scientific lepidopterists will be greatly indebted to him. Ruhl, in his *Pal. Gross-Schmetterlinge*, &c., has already done much to help in this direction, and his exceedingly accurate and careful diagnoses of the imagines and their local races, leave little to be desired in this direction, and should have eliminated largely what Mr. Verity considers the defective knowledge that has led to so many errors in the creation of varieties and aberrations with which, among the butterflies at any rate, it has not yet been our misfortune to meet. What we want is another book dealing with the life-histories of the species, especially their eggs and pupæ. We have enough and to spare of picture-books with superficial letterpress relating to the imagines (as a rule, far behind what Borkhausen and Ochsenheimer wrote more than a century ago), which retard entomological science, and serve no biological or scientific purpose whatever. We shall await Mr. Verity's proposed work with interest, and shall be pleased to notice it again when we see its scope. If Mr. Verity, too, has a first-hand field acquaintance with the eastern Palæarctic species, it will also be of great advantage, as it is here that our British knowledge fails most completely. Of the western, central, and south European butterflies we have a very fair grip.

The Duke of Bedford (Chairman), Mr. F. Crisp (Treasurer), and Mr. B. D. Jackson (Secretary), in the name of a strong committee, appeal to all naturalists for subscriptions to the "Howes' Memorial Fund." Few scientific men have endeared themselves more to their fellow-workers than the late Professor of Zoology at the Royal College of Science, and already a hearty response has been made. Particulars may be obtained from Mr. F. Crisp, 17, Throgmorton Avenue, London, E.C.

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entomologists may meet with. I will do what I can in return.—*Hy. J. Turn*
Drakefell Road, St. Catherine's Park, New Cross, S.E.

Exchange.—I am desirous of obtaining butterflies from the Malayan Archipela
the Pacific Islands. For such I offer perfect diurnals from North and South Am
North American Coleoptera.—*Levi W. Mengel, Boys' High School, Reading, Pa., U.*

Wanted.—Erycinidæ of the world. Offer for same Diurni from United St
Levi W. Mengel, Boys' High School, Reading, Pa., U.S.A.

Wanted.—Parasites from British Coleoptera. Beetles infested with *Gordius*,
material will be gratefully acknowledged.—*H. St. J. K. Donisthorpe, 58, Ken*
Mansions, S.W.

Parasitical Diptera wanted.—Will lepidopterists who may breed any dip
parasites from larvæ or pupæ kindly forward such as they do not require to me?
shall be greatly obliged.—*C. J. Waineright, 2, Handsworth Wood Road, Handsworth,*

Change of Address.—*G. Rendell* to *5, The Parade, Barry, Glamorganshire.*

MEETINGS OF SOCIETIES.

Entomological Society of London.—11, Chandos Street, Cavendish Squar
8 p.m. Meetings: October 4th.

The City of London Entomological and Natural History Society.—I
Institution, Finsbury Circus, E.C.—The first and third Tuesdays in the month, a
p.m., except in July and August.

Toynbee Hall Natural History Society.—Held at Toynbee Hall, Comm
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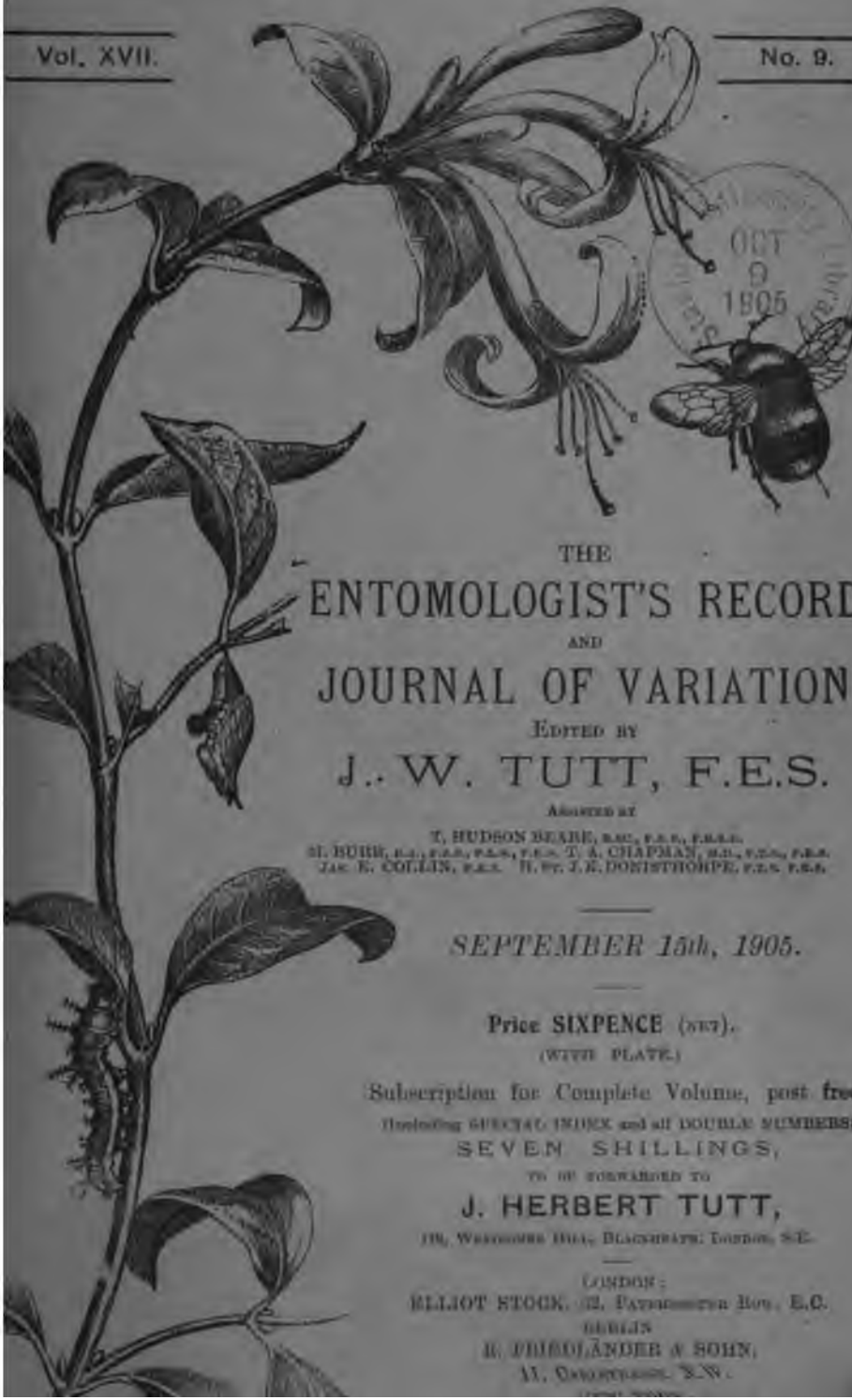

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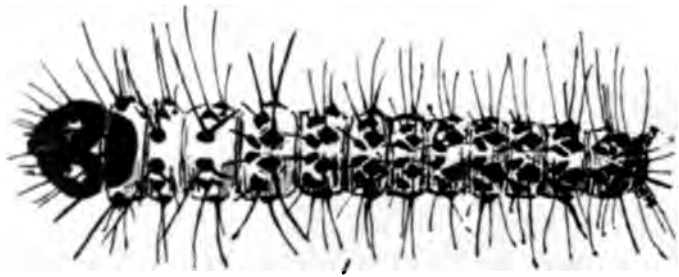

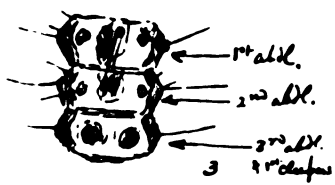

NEWLY-HATCHED LARVA OF OCNOGYNA BORTICA.

Geometra papilionaria, Linné (*with plate*).

By the Rev. C. R. N. BURROWS.

(*Concluded from* p. 205.)

In dealing with the infant larvæ of *Phorodesma smaragdaria* and *Comibaena pustulata*, I believe I was treading upon fresh ground. With *G. papilionaria*, I find this is not so. So long ago as 1888, Professor Poulton in *Trans. Ent. Soc. London* for that year, pp. 592 *et seq.*, published a paper on "The Protective resemblances of the larva of *Geometra papilionaria*," and, later, at a meeting of the Entomological Society of London, on February 2nd, 1893, he again called attention to the young larva of this species, and, I believe, exhibited drawings of the peculiar hairs with which it is adorned. This was, I believe, in connection with forked hairs in lepidoptera generally, and had no connection whatever with my particular investigations, *i.e.*, the habit of clothing in certain lepidopterous larvæ.

We seem now to have left the particular group, which we have so far been studying, for, as we shall see, the larva of *G. papilionaria* does not really clothe itself. We may, perhaps, pardonably, regard the former species as low down in the scale of civilization, yet, as having learned the desirability of clothing their nakedness, as we hear some human savages do when they meet with civilized people. Then, *G. papilionaria* is lower still. It represents, perhaps, the savage, who dons an umbrella, silk hat, or a paper collar, on state occasions, tentatively, questioningly, assertively, but well pleased soon to return to the freedom of his original nakedness. I am prepared for some of my hearers to object to this suggestion in the matter of development, but it is the best theory I can evolve. I suggest it only as a theory. Whether the clothed larvæ or the naked ones represent the more primitive form, I leave to the more advanced of my fellow lepidopterists. I present to you my drawings of the early stages of *G. papilionaria*, and I have provided a few prints also of my former drawings, that you may have an opportunity of comparing the three insects.

When first I saw this larva, I was charmed, so beautiful do the glittering hairs appear, when strongly illuminated under the microscope, but, on further examination, I was greatly disappointed, for this revealed the truth, that we have here to deal with a creature separated from those previously examined, by the absence of special organs, such as we observed in them. Here are no limbs—no pegs—(My former simile fails me now). Perhaps the special organs are not, after all, meant to secure the clothing. Perhaps the clothing may serve for the protection of these special organs. But if so, what is their use? However, here is the fact. The larvæ with special organs, clothe themselves, and those without special organs, do not, and that is quite as far as I can go at present.

If I continue to examine this group, I hope that I may not only interest myself, but may help towards a more correct and rational arrangement, by showing a closer relationship between species now thrust apart on account of their imaginal differences, or may be, a greater divergence between those placed together on account of their resemblances. It is sufficient to state that a very cursory examination of the freshly-emerged larva of *Hemithea strigata* (*thymiaria*) removed from *Geo-*

metra papilionaria by 5 pages, 8 genera, and 52 species in Staudinger's *Catalog*, shows a form in some points almost identical with the exception of size,* and it is further remarkable, that, in the drawers of the general collection at South Kensington, there is an insect placed next to *G. papilionaria*, the *prasina* of Butler, which presents the angulated wings, and more or less the general appearance of a gigantic *H. strigata*. At the same time, one recalls that Stainton, following Guenée, places *G. papilionaria* with *P. smaragdaria* and *H. strigata* at the very end of the family. Meyrick limits the genus *Geometra* to *papilionaria*, groups together *pustulata*, *smaragdaria*, *vernaria* and *lactearia*, and places *Nemoria viridata* with *Hemithea strigata*, at the head of the family; a reversal of arrangement, to which we are slowly, and sometimes very unwillingly, becoming accustomed.

Mr. South, in the "Entomologist List," following Lederer, places together *smaragdaria* and *pustulata* in his genus *Phorodesma*, quite correctly from all points of view; and *vernaria* with *papilionaria* in the genus *Geometra*, while *H. strigata* is again sent down to the very end of the family. This only shows how Doctors differ, and I shall be content if my researches provide something definite to work upon besides the mere dead dry bodies of ancient specimens.

You will, I fear, begin to think that I am again digressing. I am! The fact is that Mr. Bacot has quite taken the wind out of my sails, in his report upon the early stages of *G. papilionaria*, and after reading his notes over, I find that there is really very little left for me to say on the subject before us. I have to thank Messrs. Edelsten, Shaw, Newman and Christy, for their kindness in responding to my request for eggs of the insect for the present investigation. I was not myself very successful in rearing the larvæ, as I have been bereft of birch, and had to feed the larvæ on hazel instead. Moreover, wishing to observe them closely, I kept them in a bell-jar in my warm study, where they nearly boiled, and needless to say, did not thrive. Had I not sent some out to nurse, I should have failed altogether in rearing any beyond the second skin.

I will now proceed to read Mr. Bacot's report upon the early stages: –

Ovum (Plate viii., fig. 1a).—Length just over 1·1mm., width between ·7mm. and ·8mm., thickness slightly over ·5mm. The outline viewed from above, is a round-ended oval, slightly flattened at one, the broader, end. If viewed edgeways it is a narrow flat-sided ovoid, slightly flattened at the broader (micropylar?) end. There is a depression on either side. The egg is strong and heavy-looking, its appearance suggesting that the walls are thick. The surface is sculptured with strongly marked cells, the dividing walls of which are both high and thick, adding considerably to the appearance of strength (Plate viii., fig. 1*b*). At the blunter end, there is a small shallow circular pit, with straight rays or ribs, radiating from its centre (this I take to be the micropyle), best seen in ova which have turned to the livid hue preceding emergence. The ova forwarded to me by Mr. Burrows, are laid singly or, in one or two instances, two eggs are laid close together on leno. Their

* Since reading this paper, I have made a more careful examination of this larva, and find that I must modify this opinion somewhat. The resemblance is almost as close to *C. pustulata* as to *G. papilionaria*.

colour varies from a bright yellow, through pale pink, and then purple, to a dark livid hue. In one or two instances, the young larvæ can be seen through the semitransparent egg-shell. The larva eats a small hole at the micropylar end, but does not, in my experience, eat the shell after emergence.

LARVA.—*First instar* (Plate viii., fig. ii): Rather short and thick, of even thickness, head not appreciably wider than the thoracic segments. The skin of the larva is much wrinkled transversely, it is dark-coloured, and shows no stripes or other distinctive markings. The primary hairs (setæ) are very specialised, and widely forked. The larval movements are slow and sluggish. Head rounded, pale brown mottled with darker, in some cases nearly black, surface dead, and with short, stout glandular hairs of a whitish colour. Body brown in colour, skin much wrinkled, and with a noticeable coat of coarse spicules. It is of even thickness, with only a short taper forwards on thoracic segments to head. The 1st to 5th abdominal segments are slightly lengthened, the others are of about even length. The incisions are well marked. There are four subdivisions to the abdominal segments, the first and last of which are longer than the central ones. The body is not cylindrical, a marked lateral flange being present. The anal claspers are widely spread. The hairs on the head, scutellum, and anal plates, are more or less simple and tapering, either blunt-ended or only slightly knobbed, but, on the abdominal segments, the primary setæ i, ii, iii, iv and v (except iv on the 6th abdominal which bears a simple tapering, but rather long, hair, Plate viii., fig. 2*e*) are forked (Plate viii., fig. 2*c*). This is especially marked on the dorsal area, the forks on these hairs being quite as long as the hair is high, the stem being very short. The forks point anteriorly and posteriorly respectively. On the abdominal segments, i and ii are placed trapezoidally, iii is very far forward, iv and v are on the lateral flange Plate viii., fig. 2*f*). The marginal tubercles do not bear forked hairs, but tapering glandular ones, with open or trumpet tops. On the meso- and metathoracic segments the hairs are set in transverse line dorsally, and all the hairs (Plate viii., fig. 2*d*), are of similar character to those on the marginals of abdominals egments. I notice, in two larvæ which I have under observation, that a number of silk threads are spun from hair to hair, after the manner of stretching cotton on small pegs, stuck into a flower-bed to protect seeds from birds, and that some of the middle segments have on their lower lateral or ventral surface, small fragments of frass (?) or other dirt attached to the silk. Whether this is done purposely or accidentally, I cannot say, but the stretching of the silk hairs must have been purposeful at one time or another. At the moult, one larva had a large amount of dirt and small fragments of sawdust attached, and, as it was then high up on the foodplant, it must have either fallen or wandered previously to taking up its position for the moult, as the sawdust was on the bottom of the glass jar in which the larvæ were kept. This same habit or accident was not observed in all the larvæ, or, at least, not to the same extent, but it must be of common occurrence as I noticed the same fact when rearing the species in 1898. Before the moult, the larvæ are marked with an obscure pattern, consisting of whitish streaks. *Second instar* (Plate viii., fig. iv): The larva now tapers somewhat from the 8th abdominal segment, or thereabouts, to the head. The anal

claspers are spread very widely, and are fringed with small processes, as in the adult larvæ of *Amphidasys strataria*, etc. It is now somewhat longer and less stumpy in appearance, but the thoracic segments are compressed when at rest, making it appear much shorter. In this skin, the larva loses its large T-shaped hairs, and gains an exceedingly rough shagreened coat, caused by the great development of some of the spicules observed in the 1st skin (Plate viii., fig. 4*k*). The primary hairs are not, however, so completely merged in this secondary development as is the case with Sphingid, and in some butterfly, larvæ; they still persist, and have well marked tubercular bases, and the hairs themselves, although short, and not forked, are stout and glandular in appearance, with enlarged tops (trumpet-topped). The larva now bears raised processes on the dorsum of the mesothorax and on the 2nd, 3rd, 4th, and 8th abdominal segments (Plate viii., fig. 4*j*). The process on the 4th is very small, and that on the 8th is not so large as on the other segments. These processes are situated on the anterior edge of the segments. The prothorax also bears four small processes at the corners of the scutellum. The division of the segments is clear and sharp as regards abdominals 1 to 6, but is less distinct in the thoracic and remaining abdominals, except when the insect is crawling. The spiracles are large, and show up plainly, partly because the shagreening is faint or absent in their vicinity. The effect of shagreening is caused by the development of the spicules. These now form small, short, stout, blunt-ended processes, pure white in colour, of various sizes and lengths, from little more than buttons to club-shaped processes, or even T-shaped ones in a few instances. They are disposed more or less in longitudinal lines or stripes (Plate viii., fig. 4*k*). The head is now of a somewhat squared or trapezoidal shape, slightly notched at the crown, and of a pale brown colour. The surface is very rough and granular, speckled like the body, with small white processes, which are, however, smaller than those on the body, and less raised above the surface. The skin-surface, between the shagreening, is smooth and shiny. In colour, the larva is now partly red-brown, and partly green; the head, thorax and hinder abdominals being of the former, and the middle abdominals of the latter, hue.

In resting, it adopts the well-known attitude, the prothorax bent sharply over, almost at right angles, so that it forms the anterior end of the larva, while the head is ventral between the 1st pair of legs, the 2nd and 3rd pair of legs being thrust forward against the first. The 2nd and 3rd thoracic segments are contracted, considerably shortening the larva, and giving it a knobbed appearance. It has very possibly already been noted that, towards autumn, the birch twigs are closely speckled with small white granules of resin or sugar or something else, and are either of a green or pink coloration. The protective resemblance of the larva to its resting-place is, therefore, wonderfully perfect.

The position of the tubercles in this stage is as follows: Tubercle iii is still far forward, well above the spiracles, on most of the abdominal segments, iv and v are well below, and well separated, v pre- and iv post-spiracular, the latter at a slightly higher level. I do not notice any raising of the spiracles as in *P. smaragdaria* or *C. pustulata*. They are fairly high up on the larva, but form a tolerably even line. Neither is the position of iii, iv, or v altered. Moulting larvæ in this skin have numerous silk threads spun across the dorsal processes, and

in among the primary hairs or enlarged spicules, forming a rough network, to which a few odds and ends become attached. These fragments are of a small size, and a lens is necessary to see them properly, and it is quite possible that their attachment is purely accidental. The silk net is, however, I take it, clear evidence of the ancestral habit of making a coat.

PUPA.—Two specimens, both females, were received from Mr. F. A. Edelsten, and preserved in weak formalin solution, shortly before they were due to emerge. One of them has lengthened since its immersion in the way characteristic of pupæ just before emergence, the other has retained its normal shape, but the colours of both have become dull and somewhat yellowish, the green and the pinkish bloom having departed, and left only yellow and dull red or brown. The description of the specimen which has retained its normal shape is as follows: Length, 19mm.; from head to end of wing-cases, 11mm.; greatest diameter at 4th abdominal segment, across wing-cases, 6·5mm. The shape is cylindrical, but for the projection of the wing-cases ventro-laterally. From the 4th abdominal segment to the anal extremity the taper is gradual. A strong conical projection beyond the anus carries the armature of eight tall, slender hooks. This projection is flattened dorsally, and slightly scooped out vertically where it is strongly and evenly striated or grooved from its junction with the anus in a series of upward, and to a less extent outward, curving lines. The anus itself is a very marked feature in this particular specimen, the surface being much wrinkled and corrugated, its colour being very much darker than the general surface. Of the eight hooks above referred to as forming the armature, the two central ones situated at the apex, cross one another, and then open outwards laterally in a wide curve, very much after the manner of a gorge hook for jack-fishing. Of the three on either side of this central pair, two are fairly close to the apex and the remaining one is situated somewhat lower down in a more ventral position, and these hooks are much more compact, having a close spiral curl, not unlike that of a bishop's crozier, those of the upper two curling outwardly in a lateral direction, while the lower one is curved inwardly towards the central pair. The sexual organs are very distinct and clearly marked. Anteriorly, the pupa is bluntly rounded, the head projecting slightly. In general colour it is pale yellow, the outlines of the wings and segmental incisions being all very clearly marked in brown or reddish-brown. The surface, though dead, is smooth as a whole, but the wing-, leg-, and antenna-cases, etc., are rather more rugose, the thoracic, and especially the prothoracic, segments being strongly so, and there is also considerable shading of dark brown on the thorax, as at the anus. The spiracles are slit-like, raised and very distinct, but not distinctively coloured. With a hand lens, the tubercles are also very conspicuous, being darkly coloured, and bearing short curved setæ, there are four of these in close proximity to the spiracles on the 4th, 5th, 6th, and 7th abdominal segments, and two more on the anterior dorsal area of these segments. It seems probable that the upper of the two above the spiracle is the outermost of the trapezoidals. On the 2nd and 3rd abdominals only the two above the spiracle, and one on the dorsal area, are present, while on the metathorax, one above the base of the wing, and one on the dorsal area only are

visible. This arrangement also holds good for the mesothorax. The short prothorax has one situated at either lateral extremity. On the head-piece, between the bases of the antennæ, are two more, and two are situated on the labrum between the eyes. These last are large and prominent, the dark colour of the imaginal eyes showing through. Two small raised and roughly triangular pieces on either side of the labrum are possibly the paraclypeal tubercles of Packard. The maxillæ are very broad at the base, and fill up the entire central line, extending not quite to the end of the wingcases, the tips of the 3rd pair of legs rising from beneath them, and extending to the tips of the wings. The 1st and 2nd leg-covers, fill the space between the maxillæ and antennæ, the first stopping just short of the tips of the maxillæ, while the 2nd with the antennæ (which show clearly the cross striations) reach almost to the tip of the wings. A slip of the hindwings can be traced as far as the level of the spiracle on the 4th abdominal segment; this is very narrow at first, but rather unusually it broadens out slightly on the 4th abdominal segment.

Plate viii., fig. iii represents a larva preserved by Mr. Bacot just before the first moult, intended to show the particles entangled in the silken net, which have, however, unfortunately been lost in mounting the specimen. It will be noticed that the forked hairs now appear much smaller in proportion to the body of the larva (Plate viii., fig. iii*g*), and that some are broken, some altogether missing.

It appears to be evident that these larvæ lose their early character at the first moult. But the curious spicules, or whatever they may be, are still a very noticeable feature, increasing, as they do, in number and in size, with the growth of the larva, and, as Mr. Bacot notes, they, like the more mature special organ of *Phorodesma smaragdaria* and *Comibaena pustulata*, still have a share in securing the silken threads, with which the larva more or less protects itself. I have made a sketch of the more pronounced of these spicules (?) upon the anal flap of the larva in the 2nd skin (Plate viii., fig. iv*k*) to show how they project from, but are nevertheless embedded in, the skin.

In the adult larva, these processes are still very numerous, more or less covering the whole body, and appear to be, in some cases at least, tipped with fine hairs. I have been compelled to omit these, and also the lateral flange, from my drawings, for the sake of clearness.

Mr. Bacot does not remark about the curious way in which the first pair of legs in the larva its second stadium appear to be drawn up into these segments, or even perhaps aborted (Plate viii., fig. iv*m*).

I think that the markings upon the ova of *Geometra papilionaria* are much finer than those of *Phorodesma smaragdaria* or *Comibaena pustulata*.

In attempting the tabulation of the forms of *G. papilionaria* in the possession of collectors I have not met with much success. It is so difficult to know whether they come up to one's own ideal, without seeing and comparing the specimens. I have succeeded, however, in procuring details of 574 specimens, which may be arranged thus:—

1. Linné's type	531	5. ab. *cuneata*	12
2. ab. *prusinaria*, Hufn...	11	6. ab. *subobsoleta*	12
3. ab. *herbacearia*, Men...	2	7. ab. *deleta*	3
4. ab. *subcaerulescens* ..	3		574

Mr. H. E. Winser was good enough to send me batch of ichneumon

cocoons, which had come from a larva of *G. papilionaria.* These I submitted to Mr. E. Fitch, who identified them as *Apanteles rufipes*, Haliday. He refers me to *Trans. Entom. Soc. Lond.*, 1885, p. 175, which reads thus: "Bred in England commonly from *G. papilionaria* by Curtis. Four broods by Bignell in July, and another brood by Raynor."—P. A. Marshall.

I have to thank most sincerely Mr. Prout and Mr. Bacot for their painstaking investigations, and all those friends who by the supply or loan of material, have aided me in the preparation of these notes.

EXPLANATION OF PLATE VIII.

I. *a.* The egg.
b. ,, portion more highly magnified.
II. The larva, freshly emerged.
c. ,, the forked hairs.
d. ,, the trumpet-hairs on thoracic segments.
e. ,, long tactile (?) hair on 6th segment.
f. ,, the first abdominal segment.
III. The larva, still in first skin, but ready to moult.
g. ,, the forked hairs.
h. ,, the tactile (?) hair on 6th segment.
i. ,, the first abdominal segment.
IV. The larva, second skin.
j. ,, dorsal projection on first thoracic segment.
k. ,, spicules (?) on anal flap.
l. ,, the tactile (?) hair on 6th segment.
m. ,, the first pair of legs.
n. ,, hairs of strange forms from different parts.

Synopsis of the Orthoptera of Western Europe.

By MALCOLM BURR, B.A., F.L.S., F.Z.S., F.E.S.

(*Continued from* p. 208.)

GENUS V: CELES, Sauss.

Only one species.

1. CELES VARIABILIS, Pall.

Extremely variable in colour and size; the male is nearly always quite black, and the female dark, with black spots and a whitish cross on the pronotum; sometimes it is dirty yellowish; the wings may be red, pale blue, or white, with a black straight band on the anterior margin and the tip of the wing blackish, Length of body, 18mm.-25mm. ♂, 22mm.-34mm. ♀; of pronotum, 4mm.-6mm. ♂, 5mm.-7mm. ♀; of elytra, 14mm.-19mm. ♂, 19mm.-25mm. ♀.

A rare, but widely distributed species. In France it has been taken near Montpellier and at Loizac near Millau. It is recorded from Portugal by Charpentier, but Bolivar doubts the authenticity, as it is otherwise unknown in the Peninsula. It occurs near Vienna at Mödling, Felixdorf, and Oberweiden, the latter being the only recorded European locality for the blue form.

GENUS VI: ŒDIPODA, Latreille.

This genus contains the grasshoppers with beautifully coloured hindwings, varied with an arched black fascia.

TABLE OF SPECIES.

1. Black band of wing giving out a radial branch in front of the dividing vein, reaching towards the base of the wing.

favourable; it was terribly dirty; but, fortunately, when the weather cleared, which it did most effectually after the first few days of our arrival, we were able to be out the whole day. I paid particular attention, during our visit to the south of France, to the pairing of butterflies, and I found that invariably the paired females were freshly emerged specimens, the males, however, very frequently old and faded. I noticed among others *Colias hyale*, *C. edusa* and *Polyommatus bætica*, and, on other occasions *Aglais urticae*. Mr. Elwes records *Parnassius apollo*, and, doubtless, further instances would not be difficult to find, and further information on this point is desirable.

It was getting fairly warm when we left for London on May 1st, expecting to return to our former station, Devonport, but much to our disgust, I found orders awaiting me to proceed forthwith to Netheravon for duty. Few people, I imagine, know where Netheravon is, at any rate the officials in the Devonport office did not, but, fortunately, being born and bred in the county, I had a hazy idea it was somewhere on Salisbury Plain, and I eventually got there feeling very like Sydney Smith, who was once curate of this remote and sequestered village, and who exclaimed that though dead and buried he still had the hope of a joyful resurrection. This move, though very annoying at the time, gave me the opportunity of revisiting many of the scenes of my youth and early collecting days at Marlborough and its vicinity. It was with very great interest that I visited localities not seen for more than twenty years, and noted the changes which had taken place in the butterfly fauna in the interval. *Limenitis sybilla* and *Apatura iris* had apparently entirely disappeared. I fancy the former is here near the northern limit of its distribution, and the cold weather of 1879-80 proved fatal to it. It was fairly common, though local in certain woods from 1874 when I first came across it, till about 1880. *A. iris* was always rare, but in one locality in, I think, 1882, old Coleman, the local birdstuffer and butterfly-catcher, with whom I had made many a ramble in old days, and whom I found still alive, but very frail (he died the following winter, aged 76), and I saw a dozen or so specimens flying round a small oak-tree; a splendid entomological sight. We watched them the whole day and towards evening managed to take a female. We discussed old times together this last summer and came to the conclusion that their disappearance was due to the cutting down of the sallows on which the larvæ feed. I visited the same tree this last July, but saw nothing of the insect, and the sallows were also noteworthy by their absence. *Argynnis aglaia* and *A. adippe* were abundant in their old haunts, but *Dryas paphia* was very scarce. *Melanargia galathea* had spread its range most markedly and so also had *Thecla w-album*, but the impression left on my mind was that butterflies, in spite of the glorious summer of 1904, were undoubtedly scarcer than they were when I was a boy, and that this was not due, in the localities I have in my mind, to either increased cultivation or over-collecting. I believe my old schoolfellow, Edward Meyrick, is right in attributing it to the extraordinary abundance of starlings. I was particularly impressed with the manner in which these birds carefully and systematically quartered the ground in search of insects; I feel sure that, whatever good the Wild Birds' Protection Act is doing towards the preservation of our avifauna, it is playing the mischief with many of our butter-

flies. Salisbury Plain itself is not very productive, being too exposed and with too little variety in its vegetation. *Cupido minima* was common in many sheltered nooks. *Hipparchia semele* swarmed everywhere, *Polyommatus corydon* was also abundant, but *P. bellargus* I did not see, or *Plebeius aegon*, which I believe occurs at Old Sarum. *Lycaena arion* is said to occur on the Plain, but I did not see it, and it is not a locality where I should expect to find it. I do not think it has been taken anywhere on the Plain for very many years. I noticed one specimen of *Colias hyale* in August and *Pyrameis atalanta* was abundant in the old British camp at Sidbury.

In August I received orders to once more pack up my belongings, and, early in September, set sail for this distant spot. It would be insulting to my brother entomologists to inform them that Mauritius is not far from Madagascar, but such information was, until lately, not only needed by the War Office, but also the Education Department, from both of which seats of learning we have recently received letters addressed Mauritius, West Indies! I wonder if they appreciated the sarcasm when we suggested that to send letters to the other hemisphere entailed a considerable loss of time in answering letters.

When off Cape Verde, forty-seven miles from land the captain told me, I was surprised by the numbers of land birds flying round the ship, evidently carried out to sea by the strong northeast wind then blowing. They comprised among others, two doves, several fly-catchers and one or two yellow wag-tails. At sunset I noticed also several butterflies flying about the ship, and was wondering what species they were when a spotted fly-catcher caught one and obligingly settled at my feet, enabling me to see that it was a fine specimen of *Pyrameis cardui*. I have never been on a long voyage without noticing a number of land birds well out to sea, more particularly, perhaps, in the Mediterranean; sometimes the same individuals accompany the ship for one or two days, probably resting at night in the rigging; they suffer terribly from want of water, and I fear they mostly find a watery grave from exhaustion. A swallow on my present voyage settled on the cap of the officer on the bridge in a completely exhausted condition.

We were detained at Cape Town for a few days, awaiting the passage to Mauritius, and this gave me a brief opportunity of making a first acquaintance with South African butterflies. The season, I was told, was very backward and unprecedentedly cold, and heavy rains had delayed vegetation. However, the spring flowers were now very much in evidence, and, like most visitors to the Cape at this time of the year, I was much charmed with their beauty and variety. Butterflies were just coming on, and I managed to get one morning ramble on the mountain at the back of the town among the fir-trees which cover Table Mountain for a good way up on its northern face. *Colias electra* was fairly common and evidently just putting in an appearance. I caught two females, but did not see the pale form, which I suppose is rarer, following the custom of its cousin, *C. edusa*, which it so closely resembles in the male. Will some kindly disposed entomologist give the *Record*, for my benefit and doubtless others, the argument on which is based the theory that *Colias* var. *helice* is a survival of the Glacial Epoch, or of some long past climatic conditions. It has always seemed to me a far fetched theory, but I am so hazy about it that very possibly I misunderstand it. *Pyrameis cardui* was quite common, some specimens being

worn and others quite fresh. *Lampides boetica* and *Lycaena*, sp. ? very like *Lycaenesthes lycaenina* were represented by single specimens, and a beautiful Hesperiid, dark brown with golden spots, was abundant, flying amongst grass on the banks of a mountain stream, and occasionally taking extended flights among the upper branches of the smaller trees. A species of *Acraea* was just on the wing, and, in another few days, butterflies would probably have been numerous both in species and individuals.

We left Cape Town about October 20th for Port Elizabeth, Durban, and Delagoa Bay. When near the latter port we witnessed one of those terrible conflicts between a whale on the one side and thresher-sharks and sword-fish on the other. We passed so close to the combatants, or perhaps I should say the victim and its slayers, that we were enabled to see every effort of the unfortunate whale to rid itself of its adversaries. No sooner did it raise itself above the waves when one of the threshers flung itself clear of the water and bending itself into the form of a bow brought its tail with tremendous force on the whale's back, forcing it again below the surface, there to be again tormented by the thrusts of the sword-fish. With the aid of our field-glasses we could see the actions of the threshers very clearly, and I had no previous conception of the enormous power of these sharks. The tail appeared to me to be about fourteen feet long, and before the delivery of the blow it seemed that the end of it quite touched the head of the fish. The end of the engagement, I fear, was the usual one, and inevitable.

We reached Lorenço Marques, Delagoa Bay, October 27th, and were naturally much interested in the place, as it was by this port that the Boers received many of their munitions of war. The harbour is far away the finest in South Africa, protected as it is from winds in any direction. It is some seven miles across, and the shore to the west is very picturesque owing to the verdure and deep red colour of the cliffs. The town is still in a very rudimentary state, and a short time previously had a most unenviable reputation for malarial fever. This has now to a large extent disappeared since the extensive marsh in the centre of the town has been filled in and drained. The weather was intensely hot, but, fortunately, the heat of the sun was in a measure mitigated by a cool breeze. Mosquitoes, even in the middle of the day, were pretty vigorous, at night I am told they are still terribly numerous. The country was very dried up and reminded me very much of parts of the Punjab and Bombay. I noticed in the gardens numerous English flowers, such as marigolds and petunias, flowering freely in close juxtaposition with flamboyants, various species of *Ficus* and other tropical trees and plants. The neighbourhood of the town is being extensively laid out in building plots and will soon be built over, but, at present, one can do a good deal of entomology on the outskirts of the town, and even in it. Insects were numerous, particularly Acridiids and Hymenoptera, which latter greatly impressed me by their numbers. I saw, perhaps, fifteen species of butterflies, including *Papilio demoleus*, the larvæ of which cause considerable damage to the fruit-trees, and a goodly number of *Acraeina* sufficient to show me that breeding experiments to distinguish the various species would prove a very interesting study. After leaving Delagoa Bay we made straight for Mauritius, keeping quite close to the shore of Madagascar for about

sixty miles. I was glad to get even this small glimpse of one of the most interesting islands of the world, and live in hopes of some day visiting it.

Notes on the Life-history of Ocnogyna boetica (*with plate*).

By H. POWELL.

On November 17th, 1904, I received from Dr. T. A. Chapman a good-sized batch of the ova of this interesting Arctiid species. Being very busy at the time, I was unable to critically examine the eggs, but made a superficial examination which resulted in the following notes:

Egg.—Small, round, shiny, of a butter-yellow colour; the batch contained a considerable number, but it was not possible to determine how many, for they were all attached together in an elongated lump, those occupying the interior of the mass being hidden. Dr. Chapman has observed that the ♀ moth chooses as moist a place as possible for laying her eggs, and added, "The ♀, I imagine, almost burrows into a hole to find a place to lay them where they may be damp enough." He was afraid that he had kept them too dry and that they had thereby been damaged. However, this was not the case. I kept them in a tin box in a room facing south, where there was a fire at night. Very cold weather set in at the end of November, night temperatures of—4°C. and even—5°C., but as they were not exposed to it they did not suffer. On November 28th, the ova began to darken, and by December 1st the whole mass, with a few exceptions, had turned graphite-gray. During the time I had them, I kept a bit of lettuce leaf (changed from time to time) in the tin box with them in order to provide moisture. The earliest larvæ emerged on December 2nd, almost all the rest on December 3rd and 4th.

Foodplants.—I tried the young larvæ with several foodplants, including *Calycotome spinosa* which they would not touch. It was the nearest approach I could get to broom (*Spartium junceum*) which Dr. Chapman says is their normal foodplant. The broom has not, at this time, a trace of a leaf on it, and I examined many bushes for a leaf in vain. The larvæ picked out lettuce and groundsel as their foods, though one or two ate some *Taraxacum*. As they do well on groundsel, I planted a big pot of it, intending to turn them out on it. A large number of the young larvæ died without attempting to eat anything, and a number of eggs, although the larvæ developed in them, did not hatch, mostly I think because they were in the centre of the mass and the young larvæ could not free themselves. The larvæ look something like those of young *Arctia villica*, but are not so hairy. They are not very lively. A few larvæ appeared in the second skin on December 14th, several more on December 15th.

Larva.—*First instar:* Length of young larva 1·5mm. to 1·6mm. Head, black and highly polished. It has some long black hairs, and shorter ones, round the mouth, but none so long as those from the body tubercles. The body colour is light grey, pale straw-grey as the larva grows and shows more of it. It is semitransparent and shows a glow through when the light is thrown up from the reflector. The dark appearance of the larva when quite young is caused by the large jet-black tubercles set near together, with their long black hairs, leaving but little of the skin to be seen. As the larva fills out, the

spaces between the tubercles widen, and the larva becomes much lighter. The prothorax is provided with a broad plate, almost as deep as the segment. It is black and shiny like the head, and carries eight long black hairs, arranged as in the figure (pl. ix., fig. 1*a*). The prothoracic plate has an elongated dent in it. Plate ix., figs. 1 and 2 give a fairly accurate representation of the shiny black tubercles and their arrangement on the body. Some, it will be seen, are double, that is, carry two hairs. On the segment following the 8th abdominal, there is, on each side of the dorsal centre, a "plate" bearing four hairs (four tubercles on a common base). Another plate bearing eight hairs is just over the anal opening. Pl. ix., fig. 3 shows the ventral aspect of the 1st, 2nd, and 3rd abdominals. The venter of the 7th and 8th abdominal segments shows also some small tubercles. When well advanced in the first stage, the ground colour of the larva is pale yellow, and a subdorsal mottling of light brown appears between and around tubercles i+ii and iii (thoracic) and i, ii and iii (abdominal). It invades the dorsal centre to some extent, in some specimens, on the after part of the segments. There is also a supraspiracular mottling of brown along the sides between tubercles iii and iv. A transverse mottled band joins the two brown lines, aft of the tubercles on all segments. By December 12th, 59 surviving larvæ have nearly reached the end of the first stage, and a great many have developed "sore necks" for the moult. The length at the end of this stage is from 2mm. to 2·4mm.

Second instar: All had passed the first moult by December 19th. They had become very light coloured towards the end of the previous stage, but now they are dark again, with a rather broad, light dorsal centre. To be accurate, they are pale and rather colourless when fresh from the old skin, but darken in a few hours. Length before commencing to feed in 2nd stage, 2·4mm. and even less when startled. Walking, the larvæ reach 3mm. They curl up and drop when irritated, some hanging by a thread. Head when first moulted is white, as are also the tubercles, the bases of the setæ set on them, and the hairs themselves, being black from the beginning. The head and tubercles subsequently become black and shiny. Head much as in previous stage. It appears rather more hairy than before. The prothoracic plate, shaped as before, certainly has a larger number of hairs on it, about 14, but I have not been able to count them exactly. The general colour of the body is a livid yellowish-white, and there is a central stripe of this colour. A mottling of brown runs down the body subdorsally, partly enclosing the first large tubercles as before, *viz.*, i+ii thoracic, and ii abdominal. The lateral surface is also lightly mottled with brown, the posterior parts of the segments being best marked, the mottlings sometimes almost joining over the dorsal surface. The subdorsal mottling is sufficiently thick to appear as a consistent line under hand-lens; it is also thicker in a line running between tubercles iii and iv. The spiracles, just above and to the front of iv, are very difficult to distinguish, but at this spot when a larva was lying on its side I noticed occasional contractions of the skin, causing a temporary dimple or pit (see *postea*). The contractions came at rather long intervals, say 20 or 30 seconds, and *only affected* this particular spot. The tubercles are shiny black and

generally very large. Their shape is not quite so angular as in the preceding stage, whilst the number of hairs on most of them has much increased. The prothoracic plate has about fourteen hairs (very difficult to count), four specially long ones being set in a row near its posterior edge. Below it and farther back is the very small, low tubercle, still with a single hair. The large tubercle still farther down, but more to the front, has about six hairs (see *posteà*). Tubercle i + ii on the 2nd thoracic segment has eight hairs, tubercle iii three hairs, tubercle iv five or six hairs. Between iii and iv, but further back, in a similar position to that of the small tubercle mentioned on prothorax, is a little single-haired wart. The same arrangement occurs on the 3rd thoracic segment, tubercle i has eight (possibly nine) hairs, some being very thin and not over long, tubercle ii has certainly four hairs on this segment. Behind, and a little below iii, is a very tiny wart in a line with the small wart between ii and iii. It probably exists in preceding segment, but I could not detect it. All the tubercles are larger in this segment. On abdominal segments, tubercle i is still small and chevron-shaped, obliquely placed with a single long hair and, apparently, a very fine short hair, near its base. Tubercle ii large, nearly round, with six long hairs, tubercle iii large, elongated, obliquely placed, with six hairs, tubercle iv is of medium size, elongated, not obliquely placed, with four or five hairs, tubercle v shaped liked iv, with three to four hairs, tubercle vi very small. On the prothorax below the *2nd* (*large*) *tubercle* (not counting thoracic plate) is an elongated, double-haired, small tubercle, situated below the small wart, with a single hair; still further down a large, 7- or 8-haired, tubercle at front of the segment. The spiracle (whitish, ringed with black and roundish-oval) is aft of this large tubercle, and rather below it. Considerably further down and to the front again is the medium-sized 4-haired tubercle. (This tubercle in some lights appears to have 2 fine extra hairs). Below this are the feet. The prothorax has, therefore, on each side, exclusive of the thoracic plate, four large tubercles. On the 2nd and 3rd thoracics between iii and iv, is a wide space on which is situated a very small, almost invisible, dot, suggesting a spiracle; iv occupies a similar position to vi in the abdominal segments, and, as it is like it in shape, though larger, it probably corresponds with it, and tubercles wanting in these thoracic segments would be i (united with ii) and v; iv (truly vi) is a largish tubercle, with 5 or 6 hairs, and iv is not far above the base of the feet. The feet are black and shiny and carry a few hairs. On the abdominal segments is a very small wart in front of tubercle iv; vi is a very small elongated tubercle above the base of the claspers. On the first two abdominals it has only 1 hair, but 2 hairs on the following segments. Tubercles iv and v also have one pair less each on the first two abdominals; vi *is wanting on the 8th abdominal.* Except on the prothoracic and 8th abdominal segments, I cannot quite satisfy myself as to the position of the spiracles. The dimple mentioned before forms at irregular intervals, when the larva is frightened and rolled up, a little *behind and above* tubercle v, and in front of tubercle iv, on all the abdominals except 8. On one segment I can even make out a rounded oval ring in shape, just like the evident spiracles on prothorax and the 8th abdominal. It is just the colour of the surrounding tissues, but at this spot on all these abdominal segments the dimple forms (see *anteà* p. 238). I cannot find a trace of spiracle elsewhere, unless the tiny

warts mentioned above as being just in front of tubercle iv, are reall spiracles. This was my first impression (see *anteà*) and certainly position of the spiracle on 8th abdominal segments encourages opinion, for it is just a little higher and to the front of iv (see *posteà*). two subdorsal plates (one on each side) on the segment following the abdominal, appear to bear at least two tubercles, a smallish one tow the dorsal centre, and a large one outside and further forward. large tubercle has four (perhaps more) and the small one three h Hairs, tubercles, and plates are black and shiny. Each hair has a co base. Hairs are long and bristly. The main difference from preceding stage is in the increased number of hairs.

(*To be concluded.*)

Lepidoptera of the Val d'Hérens—Evolène, Villa, Col du Tor Ferpécle Valley.

By J. W. TUTT, F.E.S.

(*Concluded from* p. 10.)

The Col du Torrent is a grand collecting ground. Being to to climb there myself, the doctor went straight up the gully, noticed, alone, on the 11th, collecting all the way. He brought a splendid bag, in spite of the fact that he had only one small box with him. Among the most interesting of the insects he capt were *Parnassius delius*, *Melitaea aurinia* var. *merope*, *M. cynthia* in first class order, *Brenthis pales*, *Coenonympha satyrion* (one o *Polyommatus eros* of both sexes, the ♂ s worn, *P. orbitulus* in very condition, *P. hylas* of both sexes, in beautiful order, whilst *P. phl* the ♀ s in good condition, and *Cupido minima* of large size were taken. *Erebia gorge* was abundant, variable in spotting—none, and two at apex—but no var. *triopes*. *Erebia glacialis*, rather s with fulvous patch, whilst the *E. lappona* were also small; pl of *Melampias epiphron* were captured, also *Syrichthus alveus*, *Anthr achilleae*, *A. exulans*, *A. transalpina* and *Dasydia obfuscata*.

The Ferpécle valley and a climb to the Bricolla Alp on the 12th gave some first-class collecting. The little Tortricid, *Dictyopteryx manniana*, was abundant among the roses in the early morning, *Anthrocera lonicerae* and *A. transalpina* were asleep on the flo whilst *Emmelesia ericetata*, *Dasydia obfuscata*, *Larentia caesiata* and *paria sudetica* were disturbed from the rocks. Near the empty cocoo *Leucoma salicis*, on the willows, were an abundance of eggs, and lar *Pterostoma palpina* were obtained. *Parnassius apollo* was very com in the valley, where *Erebia goante* was in thousands, whilst *Epine lycaon*, *Argynnis niobe* type and var. *eris*, and *A. aglaia* were also abundant. The common Lycænids were in great quantities, and it the only occasion that I ever really saw *P. hylas* (♂ s) in real abunda here they were exceedingly numerous, but, even then, their numbers no comparison with those of *P. astrarche*, *P. damon* and *P. cor Melampias melampus* and *Erebia tyndarus* were equally abundant, as were *Syrichthus alveus* and *Pamphila comma*, with plenty of *Chrysoph virgaureae* and *Pararge maera*, both sexes, the ♂ s large and spotted. Around the inn, *Erebia stygne*, *Colias hyale*, *Lycaena a Pieris rapae*, *P. brassicae*, and one or two *E. mnestra* occu whilst just beyond the inn, *Brenthis euphrosyne* was not un

mon, and a single fine large ♀ of *B. amathusia* was evidently the laggard of a brood that was now almost entirely over. Farther on, as soon as one left the meadows and got on the moraine, *Brenthis pales*, *Erebia mnestra*, *Melampias epiphron*, *Anthrocera exulans* and *Colias palaeno* occurred, becoming commoner as one got higher, whilst over the glacier *Pieris callidice* and *Polyommatus optilete* were taken, and *Crambus radiellus* was not infrequent. High up towards the Bricolla Alp, *Erebia mnestra* was in great numbers. Here, at 7960 feet, the fauna was not unlike that of the Col du Torrent—*Melitaea aurinia* var. *merope*, *Brenthis pales*, small, brightly marked on the upperside, dark red on the underside of hindwings of ♂s; *Colias phicomone*, a ♀ of *M. cynthia* in good condition, *Erebia tyndarus*, excellent form, beautiful slaty-grey undersides, both unspotted and well-spotted uppersides; *Coenonympha satyrion*, a few fine, but evidently just going over; *Nomiades semiargus* in fine condition and not uncommon, whilst, as on the Col du Torrent, *Melampias epiphron* was abundant. Of *Chrysophanus* var. *subalpina*, two ♀s were found here, one nearly at the top of the Alp, although the species was not seen elsewhere in the valley. The great feature of the fauna here was the abundance of *E. mnestra* in both sexes, in fine condition (lower down the species was going over), whilst *Anthrocera exulans* was also much more abundant. The *P. optilete* also were in fine condition, and *Parnassius apollo* often appeared quite freshly emerged. *Botys alpinalis*, one of the *Psodos* species, and many of the other common mountain species—*Larentia caesiata*, *Dasydia obfuscata*, *Cleogene lutearia*, *Larentia verberata*, etc., were seen high up. Cases of *Taleporia pseudobombycella* were taken nearly at the top of the Alp. On the way back, between Ferpécle and Haudères, *Issoria lathonia* was noted very frequently, and *Argynnis niobe*, mostly of the silver-spotted underside form, abundant, whilst a few *Erebia ligea* were seen in a larch wood. *Nomiades semiargus* was not uncommon, and it is perhaps worthy of remark that, abundant as *P. damon* is in the lower part of the valley, it did not appear to go up the valley so far as its congeners. *Cupido minima* and *Plebeius argus* (*argyrognomon*) were also sparingly represented. *Syrichthus alveus* was, perhaps, commoner than *Pamphila comma*, especially at the runnels. *Polyommatus icarus* appears to be rare in the valley. *Melanippe galiata* was also disturbed from the rocks. *Papilio machaon* was taken both by the doctor and myself high up the valley.

SCIENTIFIC NOTES AND OBSERVATIONS.

SCENT OF THE MALE PIERIS NAPI.—Barrett states that "Mr. C. L. Perkins has recorded that the male of this species (*Pieris napi*) has, when alive, a distinct scent of verbena, and this is confirmed by Baron Sélys de Longchamps and others, who, however, compare the perfume with lemon-scented mint." Since reading that, when it was published in 1893, I have occasionally smelt this butterfly, but, until this year, could never perceive this perfume. It may have been that I was careless enough to try with females, if so, this would account for my failing to do so, for, in that sex, this scent is totally absent. This July I noticed it for the first time, and then quite accidentally. I was passing a bramble in blossom when a "white" flew from it with another one in pursuit. As I wished to get some local specimens of

the second brood of *P. rapae*, which, by the way, is not a very abundant insect here, *P. napi* being the "common white" par excellence, I tried to net them both, but only succeeded in catching the pursuer. On looking into my net to examine my capture, which proved to be *Pieris napi*, I noticed a really strong and agreeable odour, remarkably like that of the leaves of lemon-scented verbena (*Aloysia citriodora*) when bruised. This is most likely the plant Mr. C. L. Perkins refers to, and not the flowers of the garden verbena with which I have compared it, but do not consider it at all similar. I then caught the butterfly by the wings and smelt it, but did not notice the least trace of the perfume which almost immediately disappeared from the net. This being my first acquaintance with the perfume, and being connected with a male chasing a female, made me suppose that the males used it to attract and please the females during courtship, and the scent ceasing so suddenly suggested to me that the butterfly could diffuse it at will. This little experience set me experimenting with *P. napi*, and I find that the presence of the female is not in the least necessary to make the male produce its scent, and I also think it must be expelled quite involuntarily when the butterfly flaps or moves its wings. The strength of the perfume varies in different individual specimens, and seems much stronger in a freshly emerged one, old worn males smelling more faintly. I find that, if the butterfly is taken by the wings and the underside of the body smelt, hardly any trace of the scent is noticed, and sometimes not at all, but if the insect is taken by the thorax and the wings smelt from above and near the base, it can be clearly discerned, and more powerfully if it be held loosely enough for the butterfly to be able to move its wings while attempting to escape. A male *P. napi* fluttering about in a net, and so using its wings freely, emits quite a strong odour.—J. T. Bird, The Nurtons, Tintern, Mon. *July 31st*, 1905.

NOTES ON LIFE-HISTORIES, LARVÆ, &c.

Ovum of Ægeria chrysidiformis.—These flat eggs were laid singly on the muslin under which the moth or moths were confined. They adhered rather firmly to the muslin strands. In two cases two eggs were laid side by side but not touching each other, all the rest, seventy-seven, were isolated. To the unaided eye the ova appear flat, ovoid, depressed on the upper surface, and almost black in colour. Under a one-inch objective the eggs are seen to be very flat, with a large depression, occupying the greater portion of the upper surface. The walls above the depression are evenly rounded, and then run perpendicularly to the base. The micropylar pole is decidedly truncated, but the opposite pole is very bluntly pointed. When the wall of the egg is viewed along the micropylar axis, it is seen that there is a great difference in the height or depth of the two poles, the micropylar pole being nearly 0·08mm. higher than the opposite end. The following are the measurements: the long (micropylar) axis, 0·75mm.; the shorter, 0·45mm.; height (or depth) at micropylar pole, 0·3mm.; and at opposite pole 0·22mm. Colour dull, very dark grey with slight purple tinge, in fact almost black. The eggshell seems stronger, and rather hard; under a higher power it is seen to be *everywhere* very minutely pitted on the surface. The sculpture

consists of a bold network which runs all over the surface, and is composed of fine raised lines enclosing more or less pentagonal areas. The cells vary in size, but usually measure about 0·03mm. in diameter. They extend right into the circular micropylar basin which is situated in the truncated end of the egg. The rosette of the micropyle is composed of seven small, more or less pentagonal, cells. These are surrounded by about twenty similar, but larger, cells. The smallest of these micropylar cells, the inner ones, are about $\frac{1}{8}$ the size of the above mentioned network cells, and the outer cells increase in size as they are situated further from the micropyle, until they cannot be distinguished from the ordinary network cells. [Described July 18th, 1905, from eggs laid on July 8th, 1905, by two ♀s sleeved with two ♂s over a growing plant of sorrel in a flowerpot, by Mr. P. Reid. The ova were practically all laid on the muslin of the sleeve, only one appears to have been placed on the leaf.]—A. Sich.

Ovipositing of Pieris brassicæ.—On the morning of July 27th, in dull weather, with a few drops of rain falling, I watched a female *Pieris brassicae* fluttering over a patch of nasturtium. After a few minutes she selected a small young leaf in a shady corner and settled on it, depositing one egg at once (10h. 26m. 40s.), presumably as a trial; then, shifting her position slightly, proceeded to lay eighteen others, in, as far as I could see, the following order—

9 6 1
8 7 3 2
11 10 5 4
17 16 14 13 12
19 18 15

All being fairly upright except 8, which inclines upwards, and 17 downwards. The whole process was carried out slowly and deliberately, the position being carefully felt for each time. The abdomen was withdrawn between the wings during each interval, and when protruded was brought out slowly and reluctantly, just like a person taking money from his pocket unwillingly. The antennæ were kept motionless at an angle of about 45° forward and upward during the whole operation. On finishing (10h. 31m. 50s.) she rose at once, fluttered round a few times, and then flew away to a vegetable garden, apparently with the intention of laying more. The time taken works out at a rate of a little less than four a minute. All emerged by 11 p.m. on August 2nd, and were then engaged in eating the shells.—Philip de la Garde, The Grange, Buckfastleigh. *August 13th*, 1905.

Query Concerning the Pupa of Euchloë cardamines.—I recently watched the pupation of *Euchloë cardamines*. I observed that when the larval skin was slipped, the pupa evolved possessed a blunt, rounded head, without angles, more like the pupa of *Aporia crataegi*, but that, from this rounded head, a something was thrust forward, which took the well-known hornlike shape, into which the pupa finally hardened. Later on, when the time came for the development of the wings, I discovered that the horn was absolutely empty, and that the only part which could have occupied it was the comparatively tiny brush of hair upon the head. Can any of your correspondents confirm my somewhat careless observations, or offer an explanation of the use or purpose of the said horn?—C. R. N. Burrows. *August 29th*, 1905.

EGGS OF HADENA PORPHYREA (SATURA).—The eggs are laid upon one another, but, in every instance, so that the micropyle is free and unexposed. One specimen is of an uniform orange tint: the others are all white, with a purple ring just above the equator, a purple blotch about the micropyle, and other small irregular patches between these, the lower part in each instance being free from them. One egg, however, with the purple patches, has a tendency to orange coloration. The outline is a little less than ¾ of a sphere, flattened at the bottom. The longitudinal ribs average 25 in number, are very prominent, sharp-edged with a wavy outline, due to the transverse ribs crossing them; these are alternately long and short, twelve appearing in every case to be the number that goes over into the micropylar depression, the others terminating on the shoulder of the egg. The cross ribs, of which eighteen may be counted between the edge of the micropylar depression and the base, are very fine but conspicuous, and between the longitudinal ribs are ladder-like. The micropylar depression occupies a moderately large area at the apex of the egg, across which the twelve longitudinal ribs pass, forming, in the centre, a prominent conical button, at the apex of which is a very fine stellate-like depression (the micropyle proper). [Eggs described December 21st, 1897, under ⅛" lens; received from A. Heyne, Leipzig.]—J. W. TUTT.

NOTES ON COLLECTING, Etc.

PARASITES ATTACKING SLEEVED LARVA.—I have lately been rearing some larvæ of *Xylina petrificata* from the egg. These eggs were placed in a sleeve on a growing sallow-bush, and the larvæ have never been moved therefrom, but, to my surprise, I find that a number of them have been stung by ichneumons. It seems hard to conceive how an ichneumon can have reached them through the fine muslin of the sleeve, and shows how persistent these enemies are in their attack. —PERCY C. REID, Feering Bury, Kelvedon. *July 20th*, 1908.

HENOPS MARGINATUS AT BROCKENHURST.—The scarce insect, figured in Curtis as *Henops marginatus*, has occurred this year in the New Forest. He writes of it:—"My specimen I purchased from Mr. Joseph Standish, who beat them out of old whitethorn bushes in the New Forest." Meigen describes the insect under the same name. It is now supposed to be the female of *Oncodes gibbosus*.—B. PIFFARD, Ivy Cottage, Brockenhurst. *August 18th*, 1905.

APATURA IRIS AND ARGYNNIS ADIPPE AT TINTERN.—I should like to report the occurrence here of two butterflies not before observed by me in this district. These are (1) *Apatura iris*, of which a fine male was observed by my brother this July, in his garden at Tintern, settled for a considerable time on some damp brickwork, during a dull but hot day. He sent a message up to our house which, unfortunately, did not reach us at once, so I arrived on the spot a quarter of an hour too late. (2) *Argynnis adippe*, a very worn specimen, caught to-day in Llandogo, at blossom of *Valeriana officinalis*, a very attractive plant here, especially for butterflies.—J. T. BIRD, The Nurtons, Tintern, Mon. *July 31st*, 1905.

CURRENT NOTES.

Good catalogues are absolutely necessary, if we are ever to get about large collections quickly and without loss of time. One of the best and most carefully compiled catalogues that we have seen for many a day is the *Catalogue of the Erycinidae*, by Levi W. Mengel, Reading, Pennsylvania, from whom it can be obtained. The author has, for his own guidance, laid down the wholesome rule that, in making a catalogue, there should be no attempt to sink either genera or species, except in cases where it seems clear that this must be done. After all, the arrangement of a catalogue (like that of a collection) is little, the ability to get easily at what is in it is everything. The excellent index enables one to do this readily.

Mr. Percy H. Grimshaw (*Ent. Mo. Mag.*) suggests an uniform nomenclature for the bristles and hairs which are attached to the various surfaces of the legs of the Diptera, and illustrates his suggestions by reference to the common bluebottle fly, *Calliphora erythrocephala*, Mg.

Mr. Champion (*Ent. Mo. Mag.*) notes, concerning the discussion that has taken place as to whether *Lymexylon navale*, Linn., is really a native of Britain or an importation, that he and other entomologists found it quite at home in early July in the New Forest.

The current volume of *The South-Eastern Naturalist* was published within about five weeks of the conclusion of the Congress, held at Reigate this year, and, although it has on this occasion only one purely entomological paper, an excellent one by Mr. Tonge, on "Lepidopterous Ova," it contains also many papers of the highest interest to general naturalists, by many well-known experts, of which Miss Saunders' paper "Mendel's theory of Heredity," and Welchmann and Salmon's "Flora of the Reigate District," may be specially noted.

Dr. Kellogg's new work, *American Insects**, may be compared with two other excellent works, Packard's *Text-book of Entomology*, and Sharp's *Insecta* in the Cambridge series. In many respects, we consider the work under review supplements these, and, for clearness of exposition and accuracy of detail, compares more than favourably with them. To many readers, especially to those who, whilst studying specially one order, want a clear explanation of the general characters and biology of the other orders, the book must be a precious boon, from which the fact that the illustrations are taken from American insects detracts nothing. Dr. Kellogg has long undoubtedly been in the first rank of American entomologists, and this latest work can only add lustre to an already distinguished name, which will now become as well known to general entomologists as it has already long been to those who have studied his special work. We congratulate the author on a first-class production, and hope to be able to refer to the work again in a later number.

The Rev. C. R. N. Burrows will be deeply obliged to any reader who will supply him with information as to the variation, habits, or any noticeable feature in the life-history of *Hemithea strigata* (*thymiaria*).

This year the Société Entomologique de Belgique celebrates its

* Published by Henry Holt and Co., New York. 674 + vi pp. Profusely illustrated.

fiftieth anniversary, and has decided to publish a "jubilee" volume to mark the event. The growth of this society has been as marked of recent years as has those of the leading French, German, and British societies, and its work bears very favourable comparison with that produced by them. We congratulate the Society on its jubilee, and have no doubt that the goodwill which has always existed between it and its larger sister societies in other countries will always be maintained. Science knows no nation, its devotees are cosmopolitan and universal.

Mr. Porritt records the breeding of a number (80) of *Abraxas grossulariata* ab. *varleyata*, by two Huddersfield lepidopterists, during the last two seasons.

On the strength of a single specimen, taken by Mr. Kidson-Taylor in rotten fungus, in October, 1904, in Sherwood Forest, in company with *Quedius xanthopus*, Er., Mr. Newbery adds *Quedius variabilis*, Heer, to the British fauna.

Mr. Champion points out that the insect introduced into the British list by Rye, as being possibly *Anistoma oblonga*, Er. (*Ent. Mo. Mag.*, vii., p. 180; x., p. 149), was not this species, but is to be referred to *A. lucens*, Fairm., of which species another ♂ is in Saunders' collection. He points out further that *A. oblonga*, Er., and *A. grandis*, Fairm., are both forms of *A. cinnamomea*, Panz., the *A. grandis* of Rye being also a form of the same species, which was later named var. *anglica*, Rye.

Mr. C. J. Wainwright has (*Ent. Mo. Mag.*) a first class paper on the *Tachinidae*, with diagnostic tables of *vulpinus*, Fln., *comptus*, Rdni., *haemorrhoidalis*, Fall. (Rdni.), and *pudicus*, Rdni., together with further notes on the synonymy of *haemorrhoidalis*, Fall., and *impudicus*, Rdni. Further interesting notes on the genus *Roeselia* (with the distinctions of *R. antiqua*, Mg., and *R. pallipes*, Fall.), *Erione* and *Exorista* follow.

OBITUARY.

JOHN WILLIAM DOUGLAS. Died August 28th, 1905.

The notice of the death of John William Douglas, on August 28th last, at Harlesden, in his 91st year, will bring up many recollections to the minds of the older entomologists. To many of the younger lepidopterists he was possibly altogether unknown, and the greater part of his entomological work had been done by the time many of us, now actively engaged and no longer in our first youth, were born. Almost contemporary with Stephens and Curtis, who made British lepidopterology between 1820 and 1850, he was in his prime when Newman, Stainton, Zeller, Frey, and Herrich-Schäffer were moving European lepidopterology into the more modern lines of biological science, and Blackheath and Lewisham, where he and Stainton resided, were the shrine of the leading lepidopterists of Europe, for, besides these, Darwin, Jenner-Weir, McLachlan, Beaumont, and many others, then lived in the same district. The meetings of these savants were of the most pleasant description, and the younger British lepidopterists of those days met their continental confrères at the houses of one or

other of these men. Here they were encouraged to make their study of value to science, to carefully work out the life-histories and the habits of the species at their very doors, if their means did not extend to a wider study, and at the same time they were led to see that a study of only British species was insufficient to get a thorough grip of the proper relationships of the order. Elected a member of the Entomological Society of London, in 1845, Douglas was, at the time of his decease, its oldest Fellow, and the years when he was president go back so far that the writer fails to remember them.

To the lepidopterists who lived in the days of the *Intelligencer* and *Substitute*, and to those newer men who have read these old volumes with such pleasure, many details will occur to show the excellent terms on which these entomological forbears of ours lived. Many a jeu d'esprit, written and spoken, will occur to them, whilst Newman's classic, "The Song of Bugfliwatha," with its included diatribe against Spurgeon, will come back to many. To our younger readers it may not be amiss to reprint some of it, to show the position that Douglas and his family held in the hearts and esteem of his fellow entomologists. It reads:—

Should you ask me whence this story
With its music, with its magic,
With its wonderful perfection,
With its beauty and its wisdom,
With its deep and wholesome teaching,
With its learning, with its science,
With its wild conglomeration,
I should answer, I should tell you—
Jolly Douglas told me of it,
He who writ the 'World of Insects,'
He who lives at pious Kingswood—
Kingswood by the Blackheath station—
Station of the North Kent railway;
Douglas with the lots of children—
Wondrous Alice, silk-haired Laura,
Laughing Polly, fattest Harry,
And a new and perfect baby;
Jolly Douglas told me of it.
. . . . . .
Hear the song of *Colymbetes*,
Water bugfly—Bugfliwatha—
Pretty *Colymbetes fuscus*.
Hear the song of *Colymbetes*,
Hear the song as Douglas told it;
Douglas with the lots of children;
He who writ the 'World of Insects.'

One bright morn the silk-haired Laura
Wandered happy in the sunshine,
And she saw a water-bugfly
Buzzing gaily in the sunshine,
Just a speck on the horizon,
Very far off in the distance,
But she knew it was a bugfly,
Water-bugfly, *Colymbetes*,
Water-bugfly, Bugfliwatha.
On its way it met a watchman
With its stomach rainbow-tinted,
It is called the great dor-beetle,
But in science *Geotrupes*.
Then the pretty *Colymbetes*,
Waterbugfly, Bugfliwatha,
Fearful of the great dor-beetle
Plunged into a pool of water,
And the silk-haired Laura caught it,
And she took it to her father,
Took it to the Jolly Douglas,
And she writ a note about it.
"Here's a note about a bugfly,
Put it in the Wishiwashi,
Put it in the Nambipambi;"
Thus she now addressed her father.
In "The Substitute" he put it.

In the same volume (p. 174), under the title of "Beetling for Beginners," is another long rhyming jingle on the same lines, dedicated to "Gentle Laura! silk-haired Laura!" whilst another (p. 222) entitled "The Hymenoptera described," is dedicated to her baby-sister, "Child of Douglas, Pauline Zeller," etc. Our readers will agree with us that, in those days (1856), the name of Douglas was a household word among lepidopterists, one of the most generous and kindhearted of men. They will also be inclined to growl that the entomological magazines were much more readable in those days.

In 1874, Dr. Knaggs retired from his position as one of the joint Editors of the *Ent. Mo. Mag.*, and Douglas took his place. At that

time he wrote: "The unavoidable retirement of my friend Dr. Knaggs, having caused a vacancy in the joint editorship of this magazine, and it having been represented to me that I could not better serve the cause of entomology than by taking his place, I cannot resist the solicitations of my friends to occupy the position of a member of the quadruple alliance. Like Cincinnatus, I had retired from active duty; recalled, I return to it, not like him as a dictator, but as a coworker in the field I love—corde et manu."

For thirty years longer he has remained at his post. Although his earlier work was among the lepidoptera, and his revision of the Gelechiids is still considered one of the most important brochures on the subject, his chief study has, during the latter part of his life, been the Hemiptera, but a few years ago failing health led him to hand over his splendid special library of works on this order to the Entomological Society of London. None of the old school to which Douglas belonged between 1830 and 1840 are, we believe, now left. Comparatively few of those who joined the active ranks between 1840 and 1860 now remain. Still there are some, and many of these are living witnesses to the younger men, that age has little to do with virility, that men are yet only as old as they feel, and that the best work in the country is still largely the product of the nestors who remember the publication of Stainton in parts, and who found week by week their entomological heaven as each part came to hand. An excellent entomologist and a kind-hearted and generous man has gone from among us.

WILLIAM JOHNSON. Died August 16th, 1905.

It is with very much regret that I have to announce the death, in his 90th year, of my valued and venerable friend Mr. W. Johnson, who passed away on August 6th, at his residence at Wigan. About fifty or sixty years ago there existed in Lancashire and Cheshire a well known and enthusiastic band of entomologists, amongst whom were W. Johnson, Nicholas Cooke, Benjamin Cooke, C. S. Gregson, N. Greening, J. B. Hodgkinson, etc. Mr. Johnson was one of the eleven who met at my house on February 24th, 1877, when the Lancashire and Cheshire Entomological Society was founded. He always took a deep interest in the society, and was a regular attendant at the meetings, and, on his removal to Wigan, in 1889, he was honoured by being appointed an honorary member. Mr. Johnson was thorough in everything he undertook, and was devoted to his work, being for 30 years employed in the engineering department of the Mersey Dock and Harbour Board, from whom he was in receipt of a pension up to the time of his death. Mr. Johnson leaves behind him a collection of lepidoptera, which is now for sale. Amongst a number of interesting specimens is one of *Eromene ocellea*, which is one of the three recorded by Mr. Barrett, as captured near Liverpool, and which I believe was taken by himself. SAMUEL JAMES CAPPER, Huyton Park. *August 23rd*, 1905.

ERRATUM. Page 211 line 10, for "tinted blues" read "tailed blues."—O. P. CAMBRIDGE.

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Duplicates.—Muscorda, Pygmæola. *Desiderata.*—Northern and local species.—*W. K. Lister, Great Walton, Rastry S.O., Kent.*

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Duplicates.—Larvæ and pupæ of Asella, Rubricollis, Pudibunda, Carpini, Arion, Pinipenda, Dilobaria, Consortaria, Extersaria, Roboraria, Piniaria. *Desiderata.*—Pupæ of other species especially Ocellatus, Tiliae, Ligustri, Elpenor, Porcellus, Vinula.—*E. Morris, Forest View, Brockenhurst, New Forest.*

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MEETINGS OF SOCIETIES.

Entomological Society of London. 11 Chandos Street, Cavendish Square, [illegible] October 4th, 18th, November 1st, 15th, December 6th, 1905. An [illegible] 17th, 1906.

The City of London Entomological and Natural History Society. Lon [illegible] the month, at [illegible]

Toynbee Hall Natural History Society. [illegible] Toynbee Hall, Commer [illegible] in Lepidopte [illegible] Estuary." F. [illegible] A. G. Lansley. [illegible] September 3

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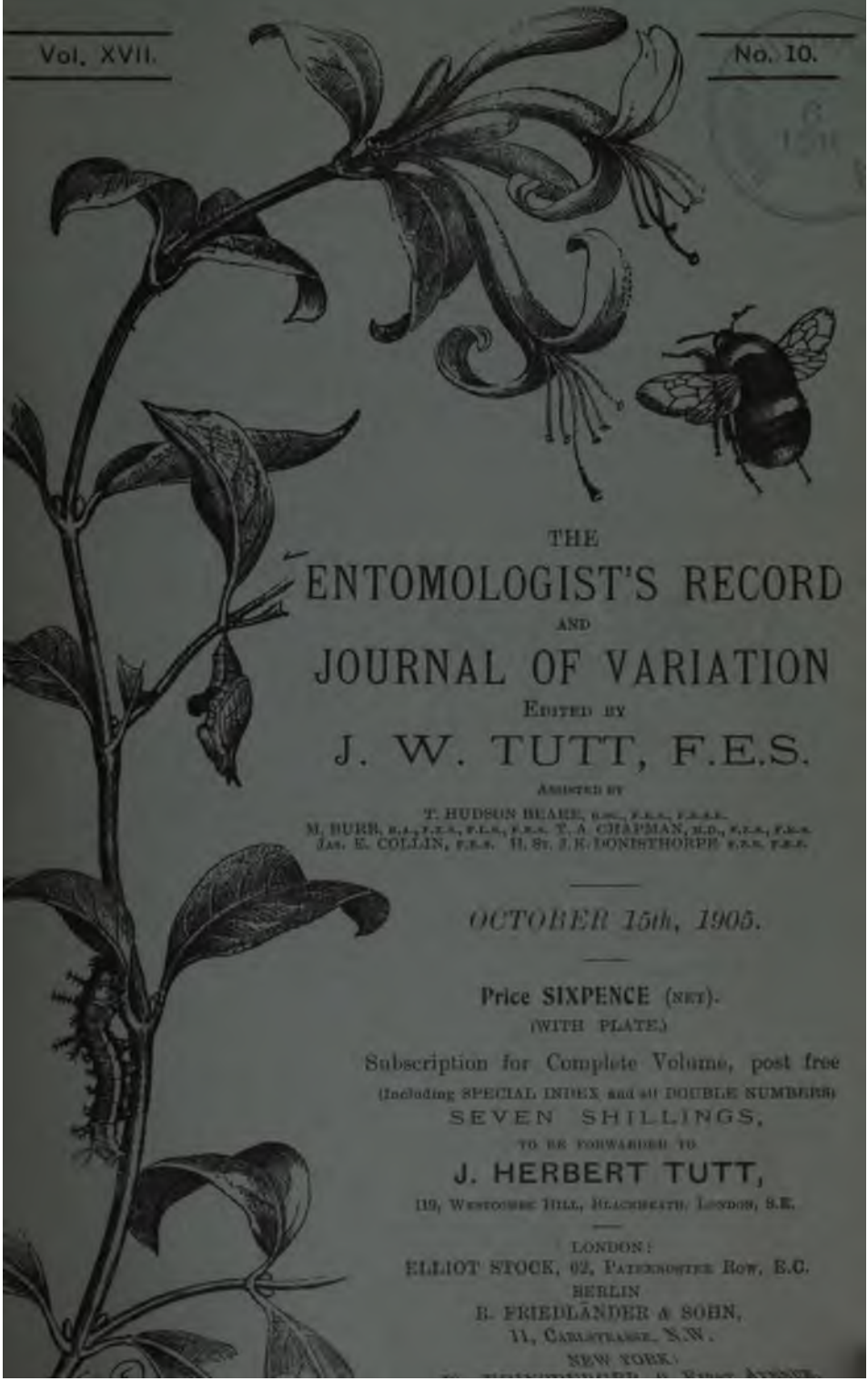

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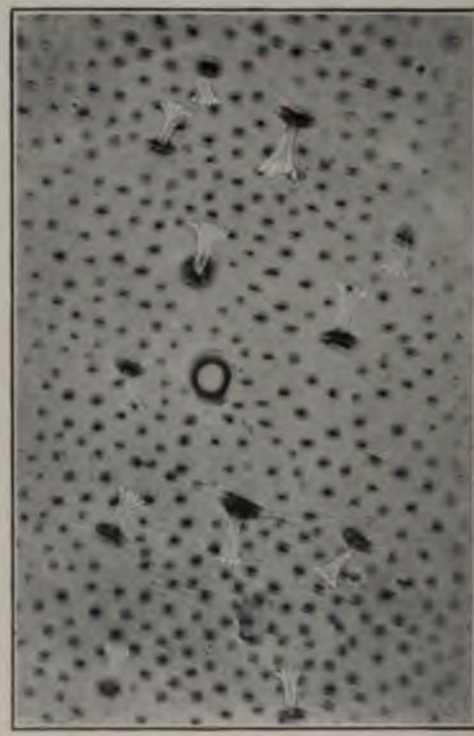

Skin of larva (in 4th stage) of Nisoniades tages, showing Lenticle and Trumpet-hairs (× 200 diam.).

Some notes on the earlier stages of Papilio machaon, particularly with regard to the colour dimorphism of its pupa.

By CECIL FLOERSHEIM, B.A., F.E.S., F.Z.S.

At the suggestion of Mr. Merrifield, I have been breeding this species during the past summer with a view to ascertaining whether the colour dimorphism of its pupa is due to a mechanical adaptation to surroundings or to any pre-existent condition—other than the variation which urged the particular larva to choose such surroundings. The experiment was carried out principally in my butterfly-house, out-of-doors, and in all respects other than that of semi-captivity, in a state of nature. As, in the course of my observations, I came upon other facts relating to the life-history of *Papilio machaon*, which appear to me to be new or of interest, I have incorporated them with this description of the result.

The ova (from wild English pupæ), with the exception of a few deposited on leaves of *Ptelea tripoliata*, were laid upon *Skimmia fragrans*, a hardy evergreen shrub of Japanese origin. chiefly upon the young shoots, between June 4th and 15th. They began to hatch about June 21st, and the larvæ fed up rapidly, the first commencing to pupate on July 22nd. It may not be amiss to attempt to give here some account of the natural contents of my butterfly-house, a light wooden structure of considerable dimensions, covered with gauze. Besides the *Skimmia*-bushes (four large and sixteen small) it holds some six young willow-trees, two *Ptelea*, many plum, birch and cherry, five small lavender-bushes, several large plants of *Aristolochia sipho*, besides *Erysimum*, pansy, phlox, sweet-william, zinnia, valerian, and other flowers, as food for the butterflies which inhabit it. Between August 1st and the time when I am writing (October 1st), I have been collecting pupæ of the *P. machaon* which fed up in it, and have, up to the present, found about 300, including those which had rotted or were devoured by predaceous beetles and other enemies before I came upon them. From *Skimmia fragrans* itself, the principal foodplant, I took 188 living pupæ, 121 being of the green variety. Of these latter I found 115 upon the young green and green-brown stems amongst the green leaves at the top of the shrubs in question; 4 upon the older wood just below the leaves, and 2 upon the black-brown stems at or towards the bottom of the bushes. The remaining 68 were of the brown variety. Of these I found 9 amongst the lower green leaves (though none upon the topmost green shoots), 10 on the older wood just beneath the leaves, and 49 upon the black-brown stems at or towards the bottom of the bushes. In addition to these, on the white-painted wood of the butterfly-house itself, I found fifteen, most of which had pupated at a distance of some two or three feet from the ground. All these were of the brown variety. From the lavender bushes I got 40 in all, 30 of which were of the green, and 10 of the brown, variety. Of these 25 of the green were either amongst the lavender leaves or on the young wood near them, whilst all the brown were upon the older wood.

With a view to obtaining confirmatory evidence of my results with *P. machaon*, I bred this summer some 40 specimens each of *Papilio asterias* and *P. philenor*, two North American species with dimorphic pupæ. *P. asterias*, as I daresay most readers of this article know, is a

near relation of *P. machaon*, the ovum and larva are very similar, though the female imago resembles *P. troilus* more closely. *P. philenor* is a subtropical butterfly, and more nearly allied to the Ornithoptera. My results with these were, however, less conclusive. I found both the green and red-brown forms of the pupa of *P. philenor* upon the white wood of the butterfly-house, though the pupæ on the young stems of *Lonicera* were of the green variety, and those on tree-stems, etc., away from green leaves were red-brown. With regard to *P. asterias* I found also that the pupæ found upon the wood of the butterfly-house were indifferently green or brown, those on its foodplant, fennel, were green. I removed, on August 6th, five larvæ which had already spun up for pupation upon the lowest black stems, and pinned them up with as little of their former surroundings as possible amongst the topmost green shoots, all five, however, changed into brown pupæ. At the same time I removed seven of the larvæ spun up amongst the green shoots, and pinned them to the black stems at the bottom of the shrubs, taking care either to remove the larvæ altogether from the brown stems to which they were attached, or to change the colour of the latter by smearing them with soot, etc. All these; however, remained green, as did two on stems which I placed indoors in a dark box. These larvæ were removed from their natural surroundings from two to five days before pupation, indeed, as soon as they were securely fixed up, a fact which, I think, proves that whatever determines the colour of the resultant pupa is an affair of some time previous to the change itself. The above observations, in addition to similar ones of previous years incline me to think that the colour dimorphism of *P. machaon* is specially of a mechanical nature, though, of course, the results are not conclusive. Amongst the young stems of *Lonicera* I found 20, the 14 green amongst the leaves or upon the young wood, with two exceptions, whilst the six blacks were all upon the lower skins of old wood. In addition to them I found a few pupæ on London Pride, perennial phloxes, etc. Twenty-four larvæ, which I removed indoors and fed upon *Skimmia* in a large breeding-cage of perforated zinc and wood, all changed to pupæ of the brown variety.

These results only confirm my observations of previous years, and it appears to me that the presence of the more common green variety is almost always coincident with pupation amongst green leaves. I think it is certain that it is not due to exposure to more light, for all the pupæ which I found in the full sunlight on the white-wood of the butterfly-house (some of these were even on the top) were of the brown kind. To turn to another matter, *viz.*, the wish to find out, if possible, when the colour of the pupa is determined. If, as I have said before, the colour dimorphism of the *P. machaon* pupæ seems, on the whole, to be of a mechanical nature, the instinct which the insect displays in its choice of an object on which to pupate is less easily explained. As I have found over and over again, the individual larva shows an extraordinary aptitude for never attaching itself either to the trunk or branches of a tree with deciduous leaves, where it would be noticed by food-hunting birds during the winter (birds destroyed 300 *P. machaon* pupæ which I had removed from their proper surroundings and pinned up out-of-doors two winters ago), or the stem of a plant which would fall to the ground during the winter, and thereby cause

the pupa to rot. Amongst the 300 or so pupæ which I collected this year, in four instances only did I find one upon a tree or a perishable stem such as grass. Two of these were green pupæ upon terminal shoots of willow resting upon a *Skimmia* bush, one a green pupa attached to a grass stem but resting against the side of the butterfly-house itself, whilst the fourth was a brown pupa amongst *Skimmia* twigs, but on the trunk of a young plum-tree growing out of a *Skimmia* bush. In all other cases the pupæ were found upon *Skimmia*, lavender, a non-deciduous *Lonicera*, London Pride, etc., where they would be exposed neither to the birds nor to the wet and mud. For the past four years I had observed the same phenomenon, and, to test the instinct of my larvæ, grew a number of sweet-peas, zinnias, annual valerian, etc., near the foodplants. I found that, though in some instances the pupæ were attached to the solid sticks running through and supporting the sweet-peas, valerian, etc., in no case had the insect's instinct betrayed it. This year I found the larvæ of *Papilio asterias* pupating, though in one or two cases only, on fennel, but as this species has a succession of broods in its natural habitat, it would not run that same risk. It would be interesting to know whether the summer brood of *P. machaon*, in south Europe, ever pupates on such perishable stems. With regard to the disputed double-broodedness of *P. machaon* in England, I may mention that one of my 300 pupæ, though kept out-of-doors and in all respects under the same conditions as the others, produced an imago on August 20th. This, a female, was a large specimen, and paler than the wont of English ones.

In addition to the pupæ which I have already enumerated in this article, there were some thirty others which were stung by the minute black Ichneumon which particularly affects *P. machaon*. I may add that in no instance have I yet observed the parasite in question attack the larva, but always the newly-formed pupa, which it searches for among the *Skimmia* leaves, etc. The attack appears to be always made immediately, or in a few hours, after pupation, before the chitinous envelope of the pupa has hardened. I have frequently watched the ichneumon flies wandering over the hardened pupa which I have collected from the bushes and suspended, evidently seeking in vain for some soft spot in the puparium in which to lay their eggs as they play over its surface with their antennæ. The pupa of *P. machaon* I have also found subject to the attack of predaceous beetles: but of these and their relentless enmity to the lepidoptera, I hope to deal in a succeeding article. In conclusion, I would like to point out a fact which I think may be of some interest to those who study the evolution of the life-habits of lepidoptera. Having come across several larvæ of *P. machaon* in the act of pupation, it struck me that it would be interesting to see whether the lateral wriggling of the newly-disclosed pupa, in its efforts to get rid of the larval skin immediately after the attachment of the cremaster, would cease upon the removal of the skin in question. I found, however, that the pupa still continued its efforts for some time, a fact which seems to prove that the struggles to get rid of the larval skin do not respond to any stimulus caused by the individual skin, but are merely generic. Next year I will compare the duration of those movements in pupæ which have had the skin removed artificially and in those with which the process is a natural one.

Some British aberrations of Polyommatus astrarche, Bgstr.

By J. W. H. HARRISON, B.Sc., F.E.S.

Polyommatus astrarche, like many other "Blues," was a little-understood species until it was finally diagnosed as a distinct species by Bergsträsser in 1779. Previously, owing to the sex distinction being marked in most blues by the colour, it had been passed over as a variety, I think, of *P. icarus*. The first noteworthy account of any aberration of *P. astrarche*, was that of Fabricius, describing *P.* ab. *artaxerxes*. He did not, of course, recognise its specific identity with *P. astrarche*, but described it as a distinct species. This description (made from a drawing sent by one of our earliest British workers) appears in the *Entomologia Systematica*, published in 1798. It is, at the most, a very unsatisfactory description, and reads as follows:—

Alis integerrimis nigris; anticis puncto medio albo, punctis lunulis rufis, subtus albo rufo punctato.

This remained the only description of the insect for ten years, when, in 1803, Haworth, from a single specimen he possessed, made a very satisfactory and minute description in his *Lepidoptera Britannica*. To one phrase in it, however, I must say I object. He says that it is "præcedenti (*astrarche*) simillima at minor." Comparing my series with a series of *P. astrarche* from Dover, I would say "at major." *P. artaxerxes* ranked as a species for some years. Then a small band of energetic workers in Durham soon discovered *P.* ab. *artaxerxes* and other forms on the Durham coast. Stephens recorded this occurrence in his *Illustrations*, in 1827. At the same time he mentions a variety "B" of *P. artaxerxes*, having the white ocelli on the lower side with black pupils. Soon after, Mr. Wailes sent Stephens some specimens from Durham. Amongst these, Stephens imagined he detected a new species. This species he named *P. salmacis*, and the description appears in the third volume of his *Illustrations*, published in 1831. The description is:—

Alis fusco-nigris, subtus fuscescentibus maculis subocellatis, anticis supra in masculis puncto discoidali atro, in feminis albo, posticis utrinque fasciâ submarginali rubrâ.

To this there are several objections. One would have thought that Stephens would have recognised that his variety "B" of *P. artaxerxes* was exactly the same as the female of *P. salmacis* described above. Again, the whole description was made upon insufficient data. Undoubtedly specimens may be freely obtained answering to the above description, but to place the white discal spot as a sexual distinction is entirely wrong. Both males and females, with, perhaps, a preponderance of the latter, possess occasionally the white spot. Further, in the species as we get it in Durham, the white spot is as often absent as present. If one had a long series of Durham *P. astrarche*, it would be seen that individuals were present rejoicing in all the various combinations of black discal spots, black spots with a white ring around, etc., with ocelli with pupils and ocelli without pupils, and also that another factor, in the extent of the red band on the upper side, added to the variation. From a consideration of the large number of individuals which had passed through his hands, Wailes was able to point out some of these objections in the *Entomological Magazine*, July, 1832. Study of long series of all three forms resulted in the recognition of their specific identity. I may say that I have had the larvæ of all three

forms together, and I could detect no difference. In Wailes' time the insect occurred all along the Durham coast, but, to the north of the Black Hall Rocks, it has been deemed extinct in recent years. This is not the case, for I have found it in plenty in one or two isolated spots. In one of these—a clearing in a wood—I have been in the habit of taking in fair numbers, for two or three years, an aberration which I think worthy of name. The following is a description of the form :—

Upperside : Hindwings with the row of red spots developed, but each spot reduced in size. Forewings with the row of red spots reduced to two near the anal angle. Discal spot black, edged with white scales. *Underside :* Hindwings, all the *white ocelli*, together with the *black pupils*, are entirely *absent*, except two. These are the discal scar (without pupil), and a minute one (with pupil) near the anal angle. Not even the white ocelli occur, as in *P.* ab. *artaxerxes*, and, in consequence, the ground colour appears of a darker brown. Forewings are normal in the majority of the examples, but in a few extreme cases they follow the hindwing exactly. For this form I suggest the name ab. *vedrae*.

Curiously enough, after naming the above form, Mr. Tutt asked me to include a description of *P. salmacis*, and, in looking this up, I found the following in Wailes' *Catalogue*, p. 29: "By far the most interesting variety of this insect I have yet seen is one in my own cabinet, which I captured in July, 1856, at Castle Eden, having the spot," etc. Here follows a description substantially the same as the above description of *P.* ab. *vedrae*. This shows that this form has occurred for at least fifty years.

Another interesting form, which is really an aberration of the above, occurs more sparingly, but has a more extended range. On the underside it agrees with ab. *vedrae*. Above, however, each red spot of the subterminal band on the hindwings is followed by a clear white dash. This form I propose to name ab. *albimaculata*. A third form I wish to note is a dwarf form. It occurs throughout the range of *P.* var *salmacis* and *P.* var. *artaxerxes*. It expands two-thirds the size of type *P. astrarche*. Beneath, the wings are of a silvery-grey, like that of *Cupido minima*. The white ocelli are very small and indistinct, and the row of four near the basal angle is reduced to two. This is of common occurrence, and when at rest is readily distinguished. The name ab. *inclara* will suffice to determine this.

Trumpet-hairs on a Skipper larva (*with plate*).

By Dr. T. A. CHAPMAN.

The curious hairs on the pupæ of certain Chrysophanid species, which take various forms, as of mushrooms, umbrellas, vases, and trumpets, and of which photographs have appeared in the *Ent. Record*, xvii., pp. 145, pl. v., figs. 1-2, of those of *Chrysophanus phlaeas*, are specialisations of a type of hair that are very common in many young larvæ of Pterophorids, Rhopalocera, etc., a transparent hair with a clubbed end, sometimes rounded, sometimes divided into several points assuming then more or less of a fan shape. Such are the hairs of the larva of *Nisoniades tages* in its first stage, but I was somewhat surprised to find that in one particular instar (at least) *N. tages* possessed hairs of as completely trumpet a form as those of the pupa of *Chrysophanus phlaeas:* surprised, because the hairs in the earlier and later instars were merely baton-like clubs, as occur in so many instances. The hairs are very minute, certainly, only 0·03mm. to 0·04mm. high, but appear to be

definitely of trumpet or calyx form, at their bases of origin about 0·005mm.-0·007mm. wide, and spreading out at the top to a fimbriated or spiculated circular margin 0·02mm.-0·03mm. across, the central opening apparently reaching quite to the base. These bases are the ordinary raised rings, with circles of articulation in the centre, found at the bases of all ordinary tubercular or skin-hairs; they are, however, very small (0·02mm. across), not wider than about three skin-points.

The photograph here reproduced to show them is by Mr. F. N. Clark. I know he is not very well satisfied with it, as the whole preparation from which it is taken is so transparent that one can hardly see it on the slide, and the difficulties of getting a good photograph of such an object are almost insuperable. I think, therefore, myself, that, however much the preparation may be unsatisfactory, the photograph is rather a triumph than a failure. I have, however, to apologise to Mr. Clark for having taken a liberty with his photograph, and touched up the outlines of the hairs, as these were so faintly paler than the ground colour that I feared they would disappear in the process of making the block, etc.

In the centre of the figure is a lenticle, rather larger than the hair bases, *viz.*, 0·025mm. in diameter, a dark chitinous ring filled with an apparently structureless membrane. The trumpet-hairs would naturally, of course, stand upright on the skin-surface, but are pressed down flat by the cover glass. The fact that the outlines are touched up must be accepted as giving them a rather diagrammatic significance, but certainly, in the result, a better idea of their appearance is conveyed, though their detailed structure, if shown more clearly, is less to be relied on than in the original photograph. It must be admitted, however, that these structures are so transparent that, even in the preparation itself, the precise structure of the hairs is less easily observed than is desirable. The small dots are the skin-points, a little indistinct in outline, possibly from the difficulties incident to securing any result in so transparent an object, and the further obscurity in the process of forming the block. The figure, however, does give a fairly good idea of the formation both of skin-points, hairs, and lenticle. The magnification is 200 diameters.

Hybrid Lepidoptera.

By J. W. TUTT, F.E.S.

Many years ago the chance pairing of two distinct species, and the production of hybrid progeny, was looked upon as a wonderful occurrence by lepidopterists. Of recent years, several experimenters, of whom Standfuss is easily first, have carried out many detailed experiments in this direction, with a view of determining certain heredity problems, sex influence, etc., as exhibited in the progeny. A few entomologists, still in love with the unusual and bizarre, simply because they are so, have offered comparatively large sums of money in order merely to possess examples of hybrids, and hence there has recently been a considerable extension of the practice of hybrid breeding, and many broods of hybrids have been reared by which science has benefited practically nothing, although the material *carefully* studied might have helped to have unravelled many knotty

points awaiting solution. We have recently been collecting the recorded instances in which hybrids have been reared for our 5th volume of *British Lepidoptera*, and, on the completion of the chapter on this subject, and because we must of necessity await publication for some time, we give herewith a complete list to date of the hybrids we have been able to discover as having been bred, and should be glad to have particulars of any others not included in the list.

Catalogue of hybrid Lepidoptera.

Arctiides.
- Spilosoma, Stphs.
  - *hybr.* crassa, Caradja (standfussi ♂ × sordida ♀).
  - *hybr.* viertli, Caradja (rustica ♂ × sordida ♀).
  - *hybr.* beata, Caradja (rustica ♂ × viertli ♀).
  - *hybr.* hilaris, Caradja (inversa ♂ × viertli ♀).
  - *hybr.* seileri, Caradja (luctuosa ♂ × sordida ♀).

Notodontides.
- Cerura, Schrk.
  - *hybr.* guillemoti, Tutt (vinula ♂ × erminea ♀).
- Notodonta, Ochs.
  - *hybr.* dubia, Tutt (torva ♂ × dromedarius ♀).
  - *hybr.* newmani, Tutt (ziczac ♂ × dromedarius ♀).
- Clostera, Stphs.
  - *hybr.* prima, Tutt (curtula ♂ × pigra ♀).
  - *hybr.* inversa, Tutt (pigra ♂ × curtula ♀).
  - *hybr.* raeschkei, Stdfs. (curtula ♂ × anachoreta ♀).
  - *hybr.* difficilis, Tutt (anachoreta ♂ × curtula ♀).
  - *hybr.* facilis, Tutt (raeschkei ♂ × anachoreta ♀)
  - *hybr.* similis, Tutt (difficilis ♂ × curtula ♀).
  - *hybr.* approximata, Tutt (facilis ♂ × anachoreta ♀).

Sphingides.
- Mimas, Hb.
  - *hybr.* leoniæ, Stdfss. (tiliæ ♂ × ocellata ♀).
- Calasymbolus, Grote
  - *hybr.* interfaunus, Neum. (astylus ♂ × ocellata ♀).
- Smerinthus, Latr.
  - *hybr.* hybridus, Stphs. (ocellata ♂ × populi ♀).
  - *hybr.* oberthueri, Tutt (atlanticus ♂ × austauti ♀).
  - *hybr.* fringsi, Stdfss. (atlanticus ♂ × populi ♀).
- Amorpha, Hb.
  - *hybr.* metis, Aust. (austauti ♂ × atlanticus ♀).
  - *hybr.* inversa, Tutt (populi ♂ × ocellata ♀).
- Theretra, Hb.
  - *hybr.* standfussi, Bart. (porcellus ♂ × elpenor ♀).
- Turneria, Tutt
  - *hybr.* vespertilioides,* Bdv. (? hippophaes ♂ × vespertilio ♀).
- Hyles, Hb.
  - *hybr.* epilobii,* Bdv. (? euphorbiæ ♂ × vespertilio ♀).
  - *hybr.* eugeni,* Mory (? epilobii ♂ × vespertilio ♀).
  - *hybr.* lippei,* Mory (? eugeni ♂ × vespertilio ♀).
  - *hybr.* pauli,* Mory (? euphorbiæ ♂ × hippophaes ♀).
- Celerio, Oken
  - *hybr.* phileuphorbia*, Mütz. (? gallii ♂ × euphorbiæ ♀).

Attacides.
- Antheræa, Hb.
  - *hybr.* perny-yama, Bourd. (pernyi ♂ × yama-mai ♀).
  - *hybr.* inversa, Tutt (yama-mai ♂ × pernyi ♀).
  - *hybr.* kirbyi, Tutt (pernyi ♂ × roylei ♀).
  - *hybr.* moorei, Tutt (roylei ♂ × pernyi ♀).
- Philosamia, Grote
  - *hybr.* wallacei, Tutt (cynthia ♂ × arrindia (lunula) ♀).

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* Those marked * require to be reared in confinement to substantiate the parentage.

Samia, Hb.
hybr. griffithsi, Tutt (cecropia ♂ × gloveri ♀).
hybr. watsoni, Tutt (cecropia ♂ × rubra (californica) ♀).
hybr. americana, Tutt (columbia ♂ × cecropia ♀).
Platysamia, Grote
hybr. heyeri, Tutt (rubra (californica) ♂ × cecropia ♀).
Actias, Leach
hybr. mortoni, Tutt (luna ♂ × selene ♀).
Saturnia, Schrk.
hybr. bornemanni, Stdfss. (pavonia ♂ × spini ♀).
hybr. hybrida, Ochs. (spini ♂ × pavonia ♀).
hybr. emiliæ, Stdfss. (pavonia ♂ × pyri ♀).
hybr. hybrida-major, Staud. (pyri ♂ × spini ♀).
hybr. hybrida-media, Staud. (pyri ♂ × pavonia ♀).
hybr. schaufussi, Stdfss. (bornemanni ♂ × pavonia ♀).
hybr. standfussi, Wiskt. (emiliæ ♂ × pavonia ♀).
hybr. risii, Stdfss. (emiliæ ♂ × pyri ♀).
hybr. schlumbergeri, Stdfss. (bornemanni ♂ × pyri ♀).
hybr. dixeyi, Tutt (bornemanni ♂ × spini ♀).
hybr. complexa, Tutt (standfussi ♂ × pavonia ♀).

LACHNEIDES.
Lasiocampa, Schrk.
hybr. wagneri, Tutt (quercûs ♂ × trifolii ♀).
Malacosoma, Hb.
hybr. schaufussi, Stdfss. (neustria ♂ × castrensis ♀).
hybr. caradjæ, Stdfss. (neustria ♂ × franconica ♀).
hybr. penzigi, Tutt (franconica ♂ × castrensis ♀).

GEOMETRIDES.
Zonosoma, Led.
hybr. brightoni, Tutt (orbicularia ♂ × trilinearia ♀).
Amphidasys, Tr.
hybr. herefordi, Tutt (strataria ♂ × betularia ♀).
Biston, Leach
hybr. pilzii, Stdfss. (hirtaria ♂ × pomonarius ♀).
hybr. hunii, Obth. (pomonarius ♂ × hirtaria ♀).
Selenia, Hb.
hybr. parvilunaria, Bartel (bilunaria ♂ × tetralunaria ♀).
Ennomos, Tr.
hybr. dartfordi, Tutt (alniaria ♂ × angularia ♀).
Tephrosia, Bdv.
hybr. ridingi, Tutt (bistortata ♂ × crepuscularia ♀).
hybr. bacoti, Tutt (crepuscularia ♂ × bistortata ♀).
hybr. ridingi-suffusa, Tutt (bistortata ♂ × delamerensis ♀).
hybr. bacoti-suffusa, Tutt (delamerensis ♂ × bistortata ♀).
hybr. mixta, Tutt (bacoti-suffusa ♂ × ridingi-suffusa ♀).
hybr. reversa, Tutt (crepuscularia ♂ × ridingi-suffusa ♀).

CYMATOPHORIDES.
Cymatophora, Hb.
hybr. fletcheri, Tutt (ocularis ♂ × or ♀).

DREPANULIDES.
Drepana, Schrk.
hybr. rebeli, Stdfss. (curvatula ♂ × falcataria ♀).
hybr. approximatula, Apatz (falcataria ♂ × curvatula ♀).

ANTHROCERIDES.
Anthrocera, Scop.
hybr. escheri, Stdfss. (trifolii ♂ × filipendulæ ♀).
hybr. intermedia, Tutt (filipendulæ ♂ × loniceræ ♀).
hybr. inversa, Tutt (loniceræ ♂ × filipendulæ ♀).
hybr. fletcheri, Tutt (trifolii ♂ × loniceræ ♀).
hybr. worthingi, Tutt (loniceræ ♂ × trifolii ♀).
hybr. secunda, Tutt (loniceræ ♂ × fletcheri ♀).
hybr. complexa, Tutt (worthingi ♂ × fletcheri ♀).
hybr. confusa, Tutt (complexa ♂ × trifolii ♀).
hybr. complicata, Tutt (loniceræ ♂ × complexa ♀).
hybr. angloitalica, Tutt (filipendulæ ♂ × ochsenheimeri ♀).

hybr. italoanglica, Tutt (ochsenheimeri ♂ × filipendulæ ♀).
PSYCHIDES.
Fumea, Stphs.
hybr. püngeleri, Tutt (casta ♂ × affinis ♀).
hybr. inversa, Tutt (affinis ♂ × casta ♀).

Rearing Acronycta (Cuspidia) tridens.

By (REV.) C. R. N. BURROWS.

Although by no means rare, this insect is always interesting on account of its close resemblance to its relative *Acronycta psi* in the imago stage, and the great difference of the larvæ, and the collector often ponders over the question—What *is* the difference between the species, and why?

Entomologists will await with interest Dr. Chapman's remarks promised to the City of London Entomological Society on March 20th, 1906, and will hope that these and the discussion following thereupon may throw some light upon the problem. I suppose that no entomologist now-a-days would care to place in his collection specimens about which he was not quite certain as to their identity. To be certain he must at present either rear the insects himself or else accept his insects upon the guarantee of others. And again each specimen must be rigorously labelled, not only with its ordinary data but also with its *name*. Only then can one feel easy as to the veracity of the two series.

There can be no doubt but that the ideal method of getting together a good series of both species, is to get the larvæ from different localities, keep them carefully separate, and I have thought, do this (in different years), lest there should be the slightest confusion or mistake. This can be easily done with *A. psi*, but I have never found *A. tridens* respond well to searching or beating. No doubt there are some districts more favoured than others by the latter species, but unless one gets the larvæ one cannot know. It is with the purpose of helping towards knowledge and specimens that I am tempted to ask the Editor to accept these notes. *A. tridens* does not appear to be very common here. I have only once or twice taken a larva, and then lost interest in it, as one does with single specimens of a pretty common species. This year (1905), however, I thought to add to my series, and bethought myself of a plan, which I believe I received from my friend the Rev. G. H. Raynor. The thing is to *box* any specimen, whether *A. tridens* or *A. psi*, whenever and however taken, as long, of course, as it is of the proper sex for the purpose. They will lay readily and abundantly, and the chip boxes containing the eggs are then to be bagged upon any suitable foodplant. If the eggs be fertile, as one hopes they will prove to be, a few weeks will tell the experimenter what is his fortune, for the young larvæ will soon show the special character. In this way one can easily get a stock of whichever species he desiderates, with very little trouble and complete certainty.

I followed this plan then, this year, at Mucking, and succeeded at once in getting a fine brood of *A. tridens*. Their life story was curiously brief, for, having hatched on June 27th, they began to emerge on August 20th, and continued to appear until September 7th, when, as far as I know every specimen had disclosed its imago. Never did larvæ give less trouble. In a large bag, they fed up quietly on plum, out-of-

TABLE OF GENERA.

1. Pronotum crested through entire length, the crest cut deeply and obliquely by the typical sulcus; hind tibiæ not hairy .. .. 1. CUCULLIGERA, Fisch.
1.1. Pronotum hardly crested behind the transverse sulcus, the prozona cut by 2 sulci vertically; hind tibiæ hairy .. .. 2. EREMOBIA, Serv.

GENUS I: CUCULLIGERA, Fischer.

Characterised by the form of the pronotum; all rather large thick-set insects.

TABLE OF SPECIES.

1. Frontal costa obsolete above the clypeus; elytra ♂ abbreviated or perfectly developed, lanceolate.
   2. Crest of pronotum, seen from side, nearly straight behind typical sulcus; elytra ♂ not surpassing 2nd abdominal segment; hinder femora yellow, hind tibiæ yellow in both sexes .. .. .. 1. HYSTRIX, Germ.
   2.2. Crest of pronotum arched behind typical sulcus; elytra ♂ as long as abdomen; hind femora blue-black on inner face; hind tibiæ with upper furrow and inner side crimson in ♂, violet in ♀ 2. APPULA, Costa.
1.1. Frontal crest extending to clypeus. Elytra ♂ perfectly developed, as broad at apex as at base (hind femora violet inside; size small) .. .. .. 3. FLEXUOSA, Serville.

1. CUCULLIGERA HYSTRIX, Germar.

Length of body, 38mm.-42mm. ♂, 43mm.-55mm. ♀; of pronotum, 13mm.-14mm. ♂, 15mm.-18mm. ♀; of elytra, 9mm.-15mm. ♂, 7mm.-9mm. ♀.

Really a native of Greece, Dalmatia, and parts of Italy, this fine and curious grasshopper has been discovered by Azam on a stony place in the plain of Canjuers, near Nonguiche in the department of Var; it is adult at the end of June.

2. CUCULLIGERA APPULA, Costa.

Resembles the last but more deeply coloured. Length of body, 35mm.-37mm. ♂, 44mm.-50mm. ♀; of pronotum, 14mm.-16mm. ♂, 16mm.-21mm. ♀; of elytra, 19mm.-25mm. ♂, 12mm-20mm. ♀.

Common in southern Italy; Apulia, Brindisi.

3. CUCULLIGERA FLEXUOSA, Serville.

Smaller than the others. Length of body, 25mm.-30mm. ♂, 32mm.-36mm. ♀; of pronotum, 8mm.-9mm. ♂, 11mm. ♀; of elytra, 22mm.-26mm. ♂, 8mm.-10mm. ♀.

Central Spain: Sierra de Guadarrama, Madrid, Aranjuez, Gredos, Albarracin, Toledo, Uclès, and perhaps Santander. On dry hills from June to August.

GENUS II: EREMOBIA, Serville.

Only one species of this genus occurs in western Europe.

1. EREMOBIA CISTI, Fabricius.

Large; hairy; yellowish-grey, with whitish spots; wings hyaline, with bright rosy patches, and a black arched fascia, often broken up into spots; hinder tibiæ yellow, gold on inner face. Length of body, 28mm. ♂, 42mm. ♀; of pronotum, 8·5mm. ♂, 12mm. ♀; of elytra, 27mm. ♂, 37mm. ♀.

Recorded by Latreille from Spain, and from Portugal by Fieber,

but Bolivar considers its existence in the country to be doubtful, and suggests the record is a mistake for *C. flexuosa*. It has occurred in Corsica, but is not known in France; it is common in Algeria.

Fam. 3: Pyrgomorphidæ.

This family contains a large number of exotic species, often very brightly and gaudily coloured, but only one, and that not a striking species, is known in western Europe. The family is characterised by the form of the vertex; the foveolæ are on the upper side, and form the border of the vertex; they are shallow and almost contiguous anteriorly, where they are separated by a short furrow; in the European genus the antennæ are short and rather thick; the frons is extremely reclined and somewhat concave, viewed laterally, so as to resemble the head of *Acrida*. The mouth-parts are situated right back almost under the posternum. The pronotum is flat above and the elytra narrow and pointed.

Genus I: Pyrgomorpha, Serville.

One west European species.

1. * Pyrgomorpha grylloides, Latreille (=*rosea*, Charpentier.)

Small and slender, especially the ♂; green or greyish; elytra and wings well-developed, the latter hyaline or tinted with rosy at the base. Length of body, 15mm.-18mm. ♂, 24mm.-30mm. ♀; of pronotum, 3mm.-4mm. ♂, 4·8mm.-5mm. ♀; of elytra, 13mm.-16mm. ♂, 20mm.-22mm ♀.

In France only in Provence, from April to June in the hottest parts of the southern littoral; Aix, Marseille, Nice, Hyères, Estère; Cannes, Antibes, Roquebrune, mouth of Rhone, Basses-Alpes; common in Spain and Portugal from May to August; also in central Italy.

Fam. 4: Pamphagidæ.

This family includes a number of large, heavy grasshoppers, all flightless forms, inhabiting desert places. The group is characterised by the form of the foveola of the vertex, which are above, as in the *Pyrgomorphidae*, but are distant from the apex, and they are not closed posteriorly; the pronotum is large, and always more or less tectiform in shape; the elytra, in all European species, are reduced to leathery flaps, and occasionally they are entirely wanting; the form of the prosternum is characteristic, being furnished with a tubercle of cubical form, or with teeth, more or less formed by the anterior border of the prosternum. The members of this family occur in the extreme south of Europe, throughout Africa, and in Asia Minor and other parts of Asia. There are three genera in western Europe.

Table of Genera.

1. Prosternum with anterior margin laminate, raised, produced in middle to a tooth, but with no strumose tubercle; mesosternal lobes with the inner border directed obliquely from the base .. .. .. 1. Ocnerodes, Brunner.

1.1. Anterior border of prosternum forming a tubercle, which is partially formed also by the disc of the same, frequently furnished also with teeth or tubercles.

2. Elytra narrow, spatulate, broader at apex than in middle; prosternum with anterior border laminate, with the tumid tubercle .. .. 2. Pamphagus, Thunb.

2.2 Elytra oval, broadest in middle; border of prosternum depressed with a bifid or 4-toothed tubercle. 3. EUNAPIUS, Stål.

Genus I: OCNERODES, Brunner.

This genus contains several species occurring in north Africa. Two occur in Europe.

TABLE OF SPECIES.

1. Pronotum truncate behind, not reaching hinder border of metanotum; dorsal abdominal segments with hinder margin not produced .. .. .. 1. BRUNNERI, Bol.
1.1. Pronotum produced behind, covering whole of metanotum; dorsal abdominal segments produced into a tooth behind .. .. 2. CANONICUS, Fisch.

1. OCNERODES BRUNNERI, Bolivar.

Length of body, 29mm.-33mm. ♂, 42mm.-59mm. ♀; of pronotum, 7mm.-9mm. ♂, 10mm.-12mm. ♀; of elytra, 4·5mm.-6·5mm. ♂, 6mm.-7·5mm. ♀; of posterior femora, 13mm.-15mm. ♂, 17mm.-21mm. ♀.

Centre and east of Spain. Manzanares; on dry barren places, the larvæ in winter, and imagines from May to July.

2. OCNERODES CANONICUS, Fischer.

Smaller than the above; length of body, 15mm.-17mm. ♂, 26mm.-30mm. ♀; of pronotum, 5mm.-5·3mm. ♂, 7mm.-9mm. ♀; of elytra, 2·5mm. ♂, 3·8mm.-4mm. ♀; of posterior femora, 8mm.-9·2mm. ♂, 11mm.-12mm. ♀.

Southern Italy; Catania, and in Sicily at Siracuse, Messina. Found also in Tunis. [The Spanish records of this species really refer to *O. brunneri*.]

Genus II: PAMPHAGUS, Thunberg.

TABLE OF SPECIES.

1. Frontal costa straight; elytra with upper margin white (very large species) .. .. 1. MARMORATUS, Burm
1.1. Frontal costa beneath ocellus sinuate; elytra unicolorous, or slightly paler on upper margin.
2. Antennæ triquetrous or ensiform.. .. .. 2. PAULINOI, Bol.
2.2. Antennæ subensiform or filiform.
3. Elytra with upper border arched from base and with a pale band along said border; body stouter; pronotum visibly broadened backwards; posterior femora of ♀s hardly 1½ times as long as pronotum.
4. Fastigium of vertex nearly horizontal, very slightly enclined, forming with the frons nearly a right angle; 1st dorsal segments of abdomen terminated by a spine or tooth 3. CUCULLATUS, Bol.
4.4. Fastigium of vertex strongly enclined, forming an obtuse on rounded angle with frons; 1st dorsal segments of abdomen not produced into a tooth but truncated.
5. Rugose and granose .. .. .. 4. MONTICOLA, Ramb
5.5. Smooth, with small impressions .. 5. PUNCTATUS, Bol.
3.3. Elytra narrow, with upper border straight as far as apex, colour uniform; body longer, less stout; pronotum of equal breadth throughout its length; posterior femora longer and more slender (in ♂s twice as long as central keel of pronotum).

4. Pronotum, seen from side, with keel slightly arched, slightly sloping in front, and almost straight up to typical sulcus. Head and pronotum rugose.
  5. Large (♂ 45mm., ♀ 72mm.). Pronotum obtusely rounded posteriorly .. .. 6. HESPERICUS, Ramb.
  5.5. Smaller (♂ 27mm., ♀ 47mm.) Pronotum truncate posteriorly .. .. 7. DECEPTORIUS, Bol.
4.4. Pronotum, seen from side, with keel regularly arched; head and pronotum smooth or finely rugose.
  5. Anterior border of prosternum emarginate; head and pronotum rugulose .. 8. MABILLEI, Bol.
  5.5. Anterior border of prosternum rounded or pointed into a tooth. Head and pronotum smooth.
    6. Anterior border of prosternum pointed; inhabits Sicily .. .. 9. SIMILLIMUS, Yersin.
    6.6. Anterior border of prosternum rounded. Spanish species .. 10. EXPANSUS, Brunner.

1. PAMPHAGUS MARMORATUS, Burmeister.

Large; green, with white markings; larvæ greyish, with white bands, abdomen strongly compressed, the dorsal segments pointed. Length of body, 46mm.-55mm. ♂, 65mm. ♀; of pronotum, 12mm. ♂, 17mm. ♀; of elytra, 9mm. ♂, 11mm. ♀; of posterior femora, 23mm. ♂, 24mm. ♀.

Sicily, Sardinia (females attaining 90mm.!), Lower Calabria; also in Algeria.

2. PAMPHAGUS PAULINOI, Bolivar.

Very like *P. mabillei*, but is the only European species with ensiform or triquetic antennæ: the spine of the prosternum is compressed behind and keeled, emarginate at the apex. The ♂ is not known. Length of body, 45mm. ♀; of antennæ, 14mm. ♀; of pronotum, 9·5mm. ♀.

Spain, Ribeiro, Milfontes.

(*To be continued.*)

COLEOPTERA.

COLEOPTERA IN 1905.—Although I have had a very good year and have taken many rare species, and a number new to my collection, still 1905 cannot be considered a good year for coleoptera, as in my experience general collecting everywhere has been of little use, and only special collecting and searching for local species has repaid one, and it is with these latter insects that these notes deal. In April, a visit to Buddon Wood for *Rhynchites interpunctatus* was successful, although the beetle was scarce. It is said to be injurious to apple-trees, but in Buddon Wood, though there are a few "crab" trees, the beetle is taken by beating the young shoots of hawthorn. Askham Bog, near York, was tried in company with my colleague Professor Beare, who is now in South Africa with the British Association, and the local *Agabus abbreviatus* occurred in plenty, other species were *Agabus uliginosus* and *A. unguicularis*, *Rhantus grapii*, *Hydroporus rufifrons*, etc. The weather was very cold and wet, and water-collecting was not at all pleasant under the circumstances. Whilst staying with my friend Dollman, at Ditchling, a series of *Stilicus subtilis* was secured

out of moss, and *Ceuthorhynchus setosus* was swept. During my stay at Bournemouth, in search of *Dinarda hagensi*, in May, some specimens of the rare *Strophosomus fulvicornis* were taken at Poole. A run up to Oulton Broad after *Donacia dentipes* was successful, Beare and I each sweeping a series, in spite of the very strong wind that was blowing. From there I went to Ipswich and a visit to Mr. Morley's field for *Harpalus froelichi* was rewarded by the capture of the species. In June I went over to Ireland, and at Lough Neagh, *Pelophila borealis*, *Bembidium argenteolum* and *B. bipunctatum*, *Dyschirius obscurus*, etc., were taken, the first three in some numbers. I then moved on to Dublin, and *Otiorhynchus auropunctatus*, the *raison d'être* of the journey, was beaten off hedges in its old locality, where *Sitones linellus* was swept not uncommonly. *Homalium rugulipenne* and *Oxytellus maritimus* were found in numbers in one small cabbage stem on the coast, the only bit of refuse that could be found for miles! On one occasion I visited the mountains above Lough Bray, an Irish jaunting-car with a big powerful horse taking me easily up the 1700 feet rise. *Agabus arcticus* and *Ilybius aenescens* were fished in some numbers out of the peat holes, other species were *Hydroporus tristis*, *H. obscurus* and *H. morio*, and three specimens of *Ilybius guttiger*, until now a doubtful Irish record. The locality in Oxfordshire for *Gyandrophthalma affinis* was next visited in company with my friend Mr. Chitty, and we both secured a nice series of this very local insect. *Ceuthorhynchus resedae* was swept in numbers off wild mignonette, and *Psylliodes hyoscyami* off belladonna, no henbane occurring this year. *Trachys pumilla*, *Mantura matthewsi*, and *Cryptocephalus lineola*, etc., were also swept. My next journey was to Southport, where, thanks to the kindness of Mr. Burgess-Sopp and Dr. Chaster, I spent a most enjoyable and successful week. The local *Aegialia rufa* and *Ammoecus brevis* were both taken on the sand-hills as were also *Anthicus bimaculatus*, and *Anisotoma ciliaris*. *Gymnetron linariae* was swept off toadflax and *Mantura chrysanthymi* off *Rumex acetosella*. *Rhynchites uncinatus* was common on *Salix repens*. In July I went down to the New Forest in search of *Lymexylon navale*. Mr. Pool having shown me a pinned specimen taken by a lepidopterist who said he had captured it in the forest last year, in the Denny district. This was not much information to work on for a beetle which had never been recorded from the forest before, however, I determined to do my best. I went all over the Denny district without coming across any traces, but on going to another part of the forest, a favourite bit of collecting ground of mine, I found what I took to be its borings in some oak-logs, and a few minutes after found a ♀ at rest on a felled oak. The next day a few more specimens were taken and then I had to return to London. I met Dr. Sharp in the forest on my way back and told him I had taken *Lymexylon*, and I am glad to say he and Mr. Champion took it in some numbers the next week, thus proving it to be well established. I beat a series of *Elater sanguinolentus* and took a number of the larvæ of *Prionocyphon serricornis* out of a hole in a tree full of water. I am sorry to say I failed to breed them, partly I believe because most of them escaped, but fortunately I sent one to my friend Hereward Dollman, who has figured it for me most beautifully, as the larva is unknown to science.

On July 18th I went with Mr. E. A. Waterhouse to look for *Adrastus pusillus*, near Sandwich, where he added it to the British list

some years ago. The insect was found again in some numbers in a new locality. Other things taken were *Malthodes atomus*, *Neuraphes sparshalli* var. *minutus*, *Hypocyptus seminulus*, etc. The search for *Dibolia cynoglossi* at Pevensey this year proved successful, the beetle being swept in some numbers off *Galeopsis ladanum* var. *canescens*. It does not occur on *Cynoglossum officinale* in this country. I then went to stay with my friend, Mr. Bouskell, at Market Bosworth, when a visit to Buddon Wood, where Dr. Barrow joined us, produced a series of *Trachodes hispidus* off oak-twigs on the ground, and I took a specimen of *Prionocyphon serricornis*. Cut grass in Mr. Bouskell's garden produced *Monotoma picipes*, *M. longicollis*, and *M. spinicollis* in some numbers, the latter being an addition to the county list. Whilst at Bournemouth, in early September, I went to Parley Heath with Mr. Jackson, as last year I took *Pissodes notatus* at the other end of the heath, and we beat a series out of young fir-trees. Studland produced *Aphanisticus pusillus* and *Sunius filiformis* under refuse. On September 14th I went to Oxford to meet Commander Walker and to collect in that district with him. *Apion schönherri* was plentiful and *Apion sanguineum* and *A. rubens* were also swept more sparingly. I was fortunate enough to sweep a specimen of the very rare *A. laevigatum*, the second specimen taken in the district, also *Anisotoma treipkei* ♂ and ♀, and *Thalacrya sericea*, both new to the district I believe. This brings us down to the middle of September and we may now consider the best of the collecting is over.—H. St. J. K. Donisthorpe, 58, Kensington Mansions, S.W.

Pterostichus parumpunctatus, Ger.—A help to its identification in the field.—An idea seems prevalent among our local entomologists that *P. parumpunctatus*, Ger., is so closely related to other Pterostichi as to be most difficult to separate. This is not so, and having had the good fortune to meet with it in fair profusion, perhaps a note on the subject may be useful. The two very common species *niger*, Schal., and *vulgaris*, L., are the only ones with which it could be possibly confused. *P. parumpunctatus* is an apterous species, the legs (in *niger* and *vulgaris*, black) are brownish-black, the posterior angles of thorax (in *vulgaris*, blunt) are right-angles, whilst the central thoracic furrow and oblong depressions on each side of the same are obviously much more deeply impressed than in either of the other species; the elytra are shining-black—in some lights showing strongly iridescent—and the three impressions on third interstice of each elytron are plainly visible without a glass. The male possesses a longitudinal keel on the last ventral segment. These rough characters at once distinguish *P. parumpunctatus*, which is placed in a subgenus of its own on the strength of somewhat peculiar subgeneric characters. Now, as to the so-called closely allied species, *P. niger* may at once be dismissed, as it is a much larger and more oblong insect, with elytra always of a *dull*-black colour, whilst *P. vulgaris* has the last abdominal segment simple in *both* sexes, characters which easily separate these from the extremely local *P. parumpunctatus*. Nearly all Bold's localities have vanished—succumbed to the strides of civilisation. Mr. Corder has, however, taken *P. parumpunctatus* at Sunderland recently, but, in that locality, the species seems to be dying out, the examples taken during the last two years being much below the average in size. In October, 1904, and again in April of this year, I took a few examples from a Dene, near Winlaton, and at Gibside in early June, a few more were met with,

whilst, about the middle of the same month, Professor Hudson Beare and I each took a single example, evidently the tail end of the spring brood. This October, when in the company of Mr. Donisthorpe, hard work brought the species to light in fair numbers at two localities in Gibside.—RICHARD S. BAGNALL, Winlaton-on-Tyne. *October 16th*, 1905.

ATOMARIA GRANDICOLLIS AT SAAS-GRUND, ETC.—I have spent the past summer at Haudères and Arolla, but the result from the collecting point of view has been very poor, both for coleoptera and lepidoptera. These valleys cannot compete with Saas as a collecting-ground. In the report of the coleoptera I captured at Saas in 1904 (*antea*, p. 179), *Anthobium impressicolle* is a lapsus for *furcicolle*. The rare *Atomaria*, supposed at first to be a new species, is *grandicollis*, Br.—M. MOSELL. *October 18th*, 1905.

CŒLIODES EXIGUUS, OL., OF BOLD'S COLLECTION = C. GERANII, PK., WITH NOTES ON THE DISTRIBUTION OF THE SAME.—Knowing Bold had taken his *Coeliodes exiguus*, Ol., in a locality where *C. geranii* occurs to me in great profusion, that *C. geranii* had not been taken by him and that he had not a type of it in his collection, I entertained doubts as to the identification of Bold's so-called *exiguus* of Oliver, though they were determined by his friend the late E. C. Rye. An examination soon proved the species in question to be *C. geranii* of Paykull, so for the present at any rate we must delete *C. exiguus* from our list of Northumberland and Durham coleoptera. *C. geranii* has been taken by the late P. J. Selby at Twizell, the late Dr. Power at Wallington, the late James Hardy, LL.D., at Axwell Park and Hartlepool, more recently by Mr. Gardner from *Geranium sanguineum* on the coast near Hartlepool, and by myself from *G. sylvaticum*, and, if I remember rightly, *G. pratense*, at Axwell Park, Winlaton Mill, and Gibside, in the Derwent Valley, and at Gilsland on the Irthing. Where met with it usually occurs in the utmost profusion, but in its habit is strangely local. For instance, between Winlaton Mill and Axwell Park there is a large patch of its foodplant (*G. sylvaticum*), yet, though it occurs on either side, it seems quite absent at the patch in question. The larvæ feed in the *Geranium* seedpods, whilst the beetle itself is most usually found with its snout buried in the centre of the flower, sometimes five or six examples in one flower-head. June is the month to look for it, though I have taken it in September from beneath the low-lying *Geranium* leaves. In confinement I have seen it subsist on both the leaves and flower petals riddling them with holes.—RICHARD S. BAGNALL, Winlaton-on-Tyne. *October 9th*, 1905.

Phymatodes lividus, Rossi, at Reading 1894 to 1905.

By FRANK BOUSKELL, F.E.S., F.R.H.S.

In 1895, I received six specimens of this insect from Mr. A. H. Hamm as *Callidium variabile*, at the same time I wrote him that they must be a local race, as they were much smaller and less variable than any *C. variabile* I had seen. During the next few years I showed them to several of our leading coleopterists, who all thought them an extreme form of *C. variabile*. This year I was confirmed in my opinion that they were not *variabile*, and on comparison with the European collection at South Kensington they turn out to be *Phymatodes lividus*, Rossi

(*melancholicus*, Fabricius). As all the British specimens have been taken by Mr. W. E. Butler of Reading, I am indebted to him for the following facts from his diary:—"June 11th, 1895, six *Callidium variabile* in the stores, I found one last year on my office window, and having found two this year I thought they must breed somewhere in the stores. I knew one old brandy cask had something feeding in the wooden hoops, I caught six *C. variabile* crawling on the cask, so no doubt that is where they came from." The following records of Mr. Butler are interesting—"May 18th, 1896, about 24; May 19th, 12; May 23rd, 12; May 28th, 12; June 12th, several; June 15th, 4; June 16th, 3; June 18th, 2; June 19th, 1; since then he has been able to take them every year. The attack has now spread to other casks. The original brandy cask, Mr. Butler believes, came from France, but had been in his stores many years before then (1894). The beetles fly about when the sun shines through the skylight, and are found paired on the casks. There appears to be very slight variation, either in colour or size, in the large number taken by Mr. Butler. As this beetle is not uncommon feeding in cask-hoops in cellars in the wine districts of France, there is no doubt as to how it was introduced. In general appearance they are not unlike small *variabile* of a much lighter build. The elytra are black, thorax testaceous usually with two black spots, sometimes quite black or with only the disc testaceous. Mr. Butler has one specimen with brown elytra. They may be distinguished from *variabile* as follows, according to Aclogue—

"El. pointillés ou finem. ponctués. Pron. ord. très tuberculeux. Une ligne longitud. auxél. .. .. *variabile*, L.
Subrugueux. Mésosternum prolongé seulem. jusquá la ½ des hanches interm. .. .. *melancholicus*, Fabr.

The following characters should easily distinguish the species :—

Elytra finely and thickly punctured. Antennæ thicker, with 3rd joint as long as 4th. Head with impressed longitudinal line in the middle, sometimes extending to the margin of thorax .. .. *variabile*, L.
Elytra thickly and more coarsely punctured, more pubescent. Antennæ thinner, with 3rd joint distinctly longer than 4th. Head without longitudinal line .. .. *lividus*, Rössi.

As this beetle has been breeding in England continuously since 1894, its claim to be added to the British list appears incontestable. The range of distribution appears to be France, Italy, Greece, and it has been introduced into the United States.

NOTES ON COLLECTING, Etc.

Polia chi in Rutland.—Both last year and this, about the middle of August, I spent a few days at Stoke Dry, a Rutland village, some 2½ miles south of Uppingham. Here I found on the walls of the Rectory, which is built entirely of Kelton stone, several specimens of *Polia chi*. I have always been puzzled by the apparently erratic distribution of this species, and never having found it, or heard of its occurrence, in Lincolnshire, I was hardly prepared to come across it in Rutland. According to Barrett (*Lepidoptera Brit. Isles*, iv., 308), it occurs in two isolated regions, *viz.*, Dartmoor, in Devon, and round Dolgelly, in North Wales. Apart from these (and the capture of a stray specimen at Oxford), its range in England seems to start at a south-

west point in Herefordshire, and then proceeds along a slanting north-east line through Worcester, Warwick, Leicester, Nottingham, and thence northwards to the top of England, but with the important exception that it does not embrace the eastern portions of the midlands. Stoke Dry is not very near the east coast, being some 50 miles distant, in a straight line from the nearest point. I should much like to know how near the coast this species occurs in the eastern midlands. —(Rev.) G. H. Raynor, M.A., Hazeleigh Rectory, Maldon. *October 9th*, 1905.

Larvæ of Drepana harpagula in Leigh Woods.—It may interest the readers of the *Ent. Record* to know that, in company with a friend, I have been successful in obtaining a few larvæ of *Drepana harpagula* (*sicula*) in the Leigh Woods during the past month.—Arthur M. Downe, Batheaston Vicarage, Bath. *October 3rd*, 1905.

Some stray Entomological notes.—(1) *Aegeria chrysidiformis*: On a visit to Folkestone in May, I was fortunate in obtaining a good number of larvæ. These were very local, one patch of sorrel plants here and there having a fair number, while other patches were searched in vain. A little experience soon told one the infected plants, which I dug up and transplanted into a breeding-cage at home. Those larvæ which I disturbed, soon burrowed into fresh plants. Some of the larvæ are still feeding, so probably they take two years to reach the pupal state. To pupate, most of the larvæ fed their way upwards to the base of the old last year's seed-stalks, and pupated in them. Sometimes the cocoon was clearly visible above the broken edges of the stalks. Emergence commenced on June 18th, and continued regularly till July 2nd, after which one emerged on July 8th, and another on July 23rd. I noticed, though I cannot find it mentioned in any entomological books, a very distinct difference in the coloration of the sexes—the females inclining to scarlet, while the males were rather orange. Possibly this is owing to the wing-scales being more numerous in one than in the other. There was considerable variation in size—on the whole, perhaps, the females are larger, but many males were larger than some females. This again, may have been due to their being bred somewhat artificially. I endeavoured to get a pairing, but apparently failed, for, although one female laid a large number of ova, they were infertile. Some of these ova I forwarded to Mr. Tutt, at his request. They were laid all over the muslin sleeve in which the insects were confined, over a growing foodplant. One only was laid on a leaf of the plant. The ova were laid on the inside surface of the sleeve, proving that the ovipositor was not pushed through the muslin. Several ova were laid on the pieces of wood which supported the sleeve. Probably, therefore, in a natural state they are laid either on the leaf or stalks of the plant. (2) *Alternative foodplants*: *Chariclea umbra* Norgate records that these larvæ eat scarlet-runner beans. Last August I collected a quantity, as also larvæ of *Eupithecia linariata*, and put them together in a breeding-cage, with both *Ononis* and *Linaria*. To my surprise the *C. umbra* larvæ deserted their own food, and ate greedily the seed-pods of the *Linaria*. *Arsilonche venosa* —I found these larvæ eat readily, and seemed to prefer, sallow. *Leucania straminea*—These larvæ feed readily on ribbon grass.—Percy C. Reid, F.E.S., Feering Bury, Kelvedon. *October 2nd*, 1905.

Odd Lepidopterological notes.—Of *Thera firmata* Barrett says:

"On the wing in June and July, and in a rather more numerous *second* generation in September and October." But larvæ which I obtained in April last, fed up very slowly, and have only now emerged. *Tephrosia bistortata*—On August 1st, I received some very small larvæ from the second brood of this insect. During the last ten days three insects of a *third* brood have emerged. Unfortunately they came out singly, so I killed them. It would have been interesting to see from a pairing whether the attempt was made by the ova or by the larvæ to hybernate. The rest of the pupæ are lying over. I may add that the larvæ were fed up entirely out-of-doors, and the pupæ have always been, and still are, outside.—IBID.

EUVANNESSA ANTIOPA IN LONDON.—On September 22nd last, I saw a specimen of *Euvanessa antiopa* in the Harrow Road, at Paddington, W., it flew out of a garden into the road, quite close to me, and afterwards into another garden. I expect it was an imported specimen which had escaped from somewhere. It was in very good condition, and the margins of the wings were distinctly yellow, not white. —HENRY J. DIXON, 29, Sutherland Avenue, Maida Vale, W. *October 11th*, 1905.

MANDUCA (ACHERONTIA) ATROPOS AT CHICHESTER.—An imago of *Manduca atropos* was brought to me, on May 8th, in fairly good condition, having been caught in a kitchen here a day or two previously. I was told by the captor that attention was drawn to it by the behaviour of the cat, which fled from the room in much alarm. This is somewhat singular, the "harmless necessary" usually regarding these large Sphinges as a "bonne boûche," being far more ready to pounce upon them, as on a bird, than to flee in fright. During absence from home in August and September, when our house was shut up, a specimen of this moth, reared from a larva found in July, emerged. It had pushed its way through a small hole in the leno covering the flower-pot, and on my return I found it clinging to the leno hanging down the side of the pot, quite dead and stiff. The place and posture in which I discovered it, indicate, I think, its lethargic habits, as it could easily have flown had it desired to do so. —JOSEPH ANDERSON, Alre Villa, Chichester. *October 12th*, 1905.

THE FOODPLANTS OF PAPILIO MACHAON.—I have just received a note from Mr. Raine, mentioning, so far as I can ascertain, a new and remarkable foodplant for *P. machaon*. He says, writing from Hyères, "I was at La Plage yesterday (*i.e.*, October 18th, 1905), and found a larva of *Papilio machaon* feeding on *Echinophora spinosa*, L., growing on the shore there. Such an extraordinary foodplant seems worth recording." *Echinophora* belongs to a section of the *Umbelliferae* that contains no so far recorded foodplant of *P. machaon*. In England its foodplant is, I suppose, *Peucedanum palustre*, and it not only eats in confinement (Buckler) *Angelica sylvestris*, but is apparently found on it in the fens. Taking its whole European range, I imagine *Daucus carota* is its commonest foodplant. Kaltenbach notes also *Carum carui*, which he places first in the list, adding *Anethum foeniculum*, *Apium graveolens*, *Daucus carota*, *Pimpinella saxifraga*, and *Angelica sylvestris*. Rühl adds to the list *Peucedanum oreoselinum* and *Heracleum sphondylium*. In Dubois I find, mentioned in addition, *Achillea millefolium* and *Artemisia absinthium*. I do not know on what authority, and should like some strong confirmations before accepting composite, as well as umbelli-

ferous, plants as accepted foods of the species. *Anethum foeniculum*, is, I suppose, a synonym of *Foeniculum officinalis*, common fennel. A. Spuler adds *Ferula*, *Meum*, and *Fragaria*, the latter certainly looks doubtful. It is very probable that there are various other umbellifers that it will eat, or may even be found on in nature, but the one in which Mr. Raine has found it seems certainly one of the least likely.—T. A. CHAPMAN, M.D., Betula, Reigate. *October*, 1905.

A SECOND BROOD OF EPIONE APICIARIA.—On July 30th I took in my moth trap here two female specimens of *Epione apiciaria*. During the next two days each deposited a few ova round the glass-topped box in which it was placed. These ova in about a week turned to a dull red colour. On August 14th one batch of ova hatched. These (there were eight) larvæ fed up rapidly on willow, and about September 6th began to spin slight webs round the lid of the glass-topped box and became pupæ. From September 27th to October 7th, eight specimens, five males and three females, emerged. The other batch are ova still. Both batches of ova were kept under the same conditions in a room facing northeast. In *Practical Hints*, pt. iii., p. 12, it is stated that the oval stage of *Epione apiciaria* lasts 9½ months. The above proves an exception to this rule.—A. DRUITT, Willow Lodge, Christchurch. *October 12th*, 1905.

PAIRING HABITS OF BUTTERFLIES.—Some time since (*anteà*, vol. xiii., pp. 298, 328) there were notes by various observers as to the sex which carried the other when the species were disturbed whilst in *copula*. With regard to this I should like state that on July 28th, 1905, at Eastbourne, I saw a ♂ *Pieris rapae* carrying the ♀, and on the 29th, I saw a ♂ *Polyommatus corydon* carrying a ♀, and a ♀ *Epinephele ianira* carrying a ♂. The two latter were also seen by Mr. G. B. Smith, whose attention I drew to the fact.—C. W. COLTHRUP 127, Barry Road, East Dulwich. *October 9th*, 1905.

CIDARIA PICATA IN MONMOUTHSHIRE.—Monmouthshire may be added to the list of counties given by Mr. Barrett as localities for *Cidaria picata*, which is referred to in the Rev. G. H. Raynor's article on this species (*anteà*, p. 266). I have met with it in this neighbourhood, but fancy it must be very scarce, having only seen three or four in 1904 (July 12th to August 1st), and a single specimen this year, date not recorded.—J. F. BIRD, The Nurtons, Tintern, Monmouthshire. *October 18th*, 1905.

THE FOODPLANT AND DISTRIBUTION OF THYMELICUS ACTÆON IN BRITAIN.—In *Practical Hints*, pt. iii., p. 68, Mr. Tutt notes that the larvæ of *Thymelicus actaeon* may be found from Swanage to Weymouth "feeding on the leaves of *Brachypodium sylvaticum*." This statement is unquestionably erroneous, for the only known natural foodplant of *T. actaeon* in Britain is *Brachypodium pinnatum*, nor does *B. sylvaticum* occur in the insect's Dorset haunts. In *Ent. Mo. Mag.*, xxv., p. 283, the Rev. E. R. Digby, at my urgent request, published extracts from a letter received by him from the late Mr. W. Buckler, in which the latter acknowledged his mistake in having at first identified the foodplant of *T. actaeon* as *B. sylvaticum*, instead of *B. pinnatum*. Subsequently, in *Ent. Mo. Mag.*, ser. 2, iv., p. 214 (1893), I had occasion to correct a repetition of the error, which, alas! after being published by Buckler in the *Ent. Mo. Mag.*, and re-published in his *Larvae of British Butterflies and Moths*, seems to be quite immortal. Again, in

Practical Hints, iii., p. 104 (last line) *Brachypodium sylvaticum* might be correct of larvæ pupating in confinement, but, although it is attributed to Zeller, I am not aware (speaking entirely from memory, being separated from my library) that he found the larva in nature on this grass, though he did so on *Calamagrostis epigejos*, in Austria [surely in Posen.—Ed.]. In confinement wild-caught British larvæ of *T. actaeon* have been found to thrive well upon *Triticum repens* (Buckler) and *Brachypodium sylvaticum* (Mrs. E. S. Hutchinson). While referring to *T. actaeon*, it may be as well to point out that the late Mr. C. G. Barrett wrote of it, in his *Brit. Lepidoptera*, i., 289, "There is no record of its occurrence east of Weymouth." This, however, is an error, and is all the more unaccountable because the writer had just previously quoted my published remarks about its occurrence in the Isle of Purbeck, and on both sides of Lulworth, all of which localities lie to the "east" of Weymouth! Nor can "east" be a *laps. cal.*, or a misprint, for "west," for this butterfly has long been recorded as frequenting spots further west than Weymouth.—Eustace R. Bankes, M.A., Corfe Castle. *September 26th*, 1905. [The error is of course Buckler's, the correction having been unfortunately at the time missed, although it should have been remembered, but we suspect that, if we accredited Zeller with the second supposed slip, Zeller did say so in some or other of his writings to which we referred at the time. We were very disgusted this year with our lack of botanical knowledge, for we wished to determine the grass among which *T. actaeon* was flying abundantly at Bourg St. Maurice, but were quite unable to distinguish it from what we have always considered *Brachypodium sylvaticum*. It may have been this of course, but it possibly was not, and we lost our specimen thereof before reaching home. An entomologist has, unfortunately, much to get into a portmanteau, and there are only 24 hours in a day. Most of the continental authorities give *Brachypodium sylvaticum* as a foodplant for this species.—Ed.]

SCIENTIFIC NOTES AND OBSERVATIONS.

On the assembling of Notolophus gonostigma.—On June 29th and July 1st this year I bred two females of *Notolophus gonostigma* from larvæ beaten at Brentwood. The latter day being a Saturday, and coming out sunny about noon after a rainy morning, I made all speed to take these females down to their old home, in order to find them mates. I arrived on the ground at about 2.30 and found the males flying from that time till 5.20, although they got decidedly scarcer after the first hour. The weather was tolerably warm, with a strongish south wind. I must have seen nearly 50 males in all, and secured just 24, mostly in fine condition. What interested me most, though it lost me so many specimens, was their curiously specialised habit in seeking the females. Of course, there is no doubt that they come up by "following the scent," but when they got close this invariably failed them or was abandoned, and they substituted a systematic search about the branches of the tree, prying in under the tufts of leaves, and quite evidently knowing by instinct just where the female cocoons ought to have been spun up. Very few came and settled on my assembling cage, which was hung from an outside twig in order to give me a fair chance with the net, and a large number abandoned

their quest in despair before ever giving me the opportunity for a stroke. Add to this that the flight seems even more rapid and erratic than that of *N. antiqua*, and that the somewhat darker colour makes them less conspicuous on the wing, so that I seldom saw them approaching or departing, and it will be realized that I had pretty exciting sport. When the flight was over, I introduced three males into the cage, and two pairings were readily obtained. The previous removal of the females from their cocoons seemed to be no obstacle.—LOUIS B. PROUT, 246, Richmond Road, N.E.

PERIZOMA BIFACIATA (EMMELESIA UNIFASCIATA) FOUR WINTERS IN PUPA.—It is well known to breeders of *Perizoma bifaciata* (*unifasciata*) that it not infrequently passes three winters in the pupal stage, and the fact has occasionally been recorded; but I have never met with any record for a longer period either with this or, so far as I can remember, with any other Geometrid species. It may therefore be of value to report that on August 2nd and 15th this year (1905) I bred two perfect specimens from pupæ which resulted from Sandown larvæ collected in 1901. My friend, Mr. J. E. Gardner, also bred one earlier this year (indoors) from a pupa which had passed the same abnormal number of years. One cannot help suspecting that the wretched summers of 1902 and 1903 may have had some influence in this, as certainly an unusually large percentage of the 1901 stock went over two and three winters.—LOUIS B. PROUT, 246, Richmond Road, N.E. *September 27th*, 1905.

IMMIGRATION OF PYRAMEIS ATALANTA AND EUCHELIA JACOBÆAE.—There has been an immigration of *Pyrameis atalanta* and *Euchelia jacobaeae* this year. That of *P. atalanta* was on a much smaller scale than that of last year, but details concerning it and *E. jacobaeae* would be very interesting. Would entomologists who have observed movements of these species in their districts please publish notes? *E. jacobaeae* appeared in inland localities near Chester-le-Street, Durham, during the first week in June. This is fully sixteen miles from its nearest habitat in Northumberland and Durham. Normally it is a coast insect in these counties, and one can only rely upon taking it on the Northumberland coast from Cullercoats to a little north of Warkworth.—J. W. H. HARRISON, B.Sc., Birtley R.S.O., Durham. *September 11th*, 1905.

NOTES ON LIFE-HISTORIES, LARVÆ, &c.

OVUM OF MELANGARIA GALATHEA VAR. PROCIDA, AND COMPARISON WITH THAT OF M. GALATHEA.—Upright egg, fairly globular in shape, diameter to length of micropylar axis as 1 to 1·02. Micropyle on the summit in a minute depression. The base, opposite the micropyle, has a small but well-defined depression, on which the egg will stand perfectly upright. Height 1·17mm., diameter 1·14mm. Colour, pale whitish-buff, normally without markings, but many of the ova bore ochreous, evidently accidental, stains. Smooth and dull to the unaided eye. *Sculpture:* The whole surface of the egg is very minutely pitted. At the base of the egg little bosses may be observed like minute points; from these run minute ridges which, about halfway up the walls of the egg, arrange themselves into vertical lines. These lines soon commence forming cells, either by branching out or running together. Gradually, as the cells approach the summit, they become more and more clearly

defined, as also do the raised points. Both the size and shape of the cells vary greatly. They may be elongated hexagons, ordinary pentagons, or even diamond-shaped. The micropylar cells are very small, they become so rather suddenly, and number usually about fifty, but often less. The rosette appears to consist of eight cells not differing from the others. [Described August 14th, 1905, from ova received from Mr. Henry Turner, who took the ♀ butterflies at Gavarnie, Hautes-Pyrenées. A few days later I was able to compare these ova side by side with those of *Melanargia galathea*, kindly sent by Mr. H. Main.] The ovum of var. *procida* differs in size and shape from that of *galathea*, though these differences can scarcely be appreciated by the unaided eye. It is larger and its height is greater than the diameter, while in *galathea* the height is a little less than the diameter, the measurements being: height 1·0mm., and diameter 1·04mm. The depression at the base of the egg of *galathea* is larger than that of the ovum of var. *procida*, making, therefore, the former a flatter egg. In other respects the eggs are indistinguishable.—ALFRED SICH, F.E.S. *October 3rd*, 1905.

EGGLAYING OF MELITÆA ATHALIA, ETC.—The female, when ovipositing, rested on the underside of a leaf of *Plantago lanceolata*. The one observed rested almost half-an-hour. The abdomen was curved and moved slowly about as the eggs were laid in not very regular masses. (I had a number of females, and the number of eggs in the batches varied from 18-120.) These masses were bounded by the ribs of the plantain. As oviposition proceeded, the wings were occasionally opened out and then closed up. I had ♀ s of *M. aurelia* and *M. parthenie*, ovipositing at the same time, and was astonished at the difference. The ova of *M. parthenie* were laid in close compact masses, those of *M. athalia* fairly close and irregular, *M. aurelia* in lines very regularly laid out along the plantain. They varied in size—*M. athalia* largest, next *M. parthenie*, then *M. aurelia*. Those of *M. parthenie* turned bright yellow very soon, those of *M. athalia* remained greenish-white until just before hatching, when they became greenish-yellow, those of *M. aurelia* remained whitish throughout. All three showed the dark heads of the larvæ a day or two before hatching. I may point out that the ova of *M. athalia* were not all deposited in one batch, and that oviposition generally took place about mid-day (probably depending on the sun and heat). One female I had, laid a batch on Monday, and, the following days being cloudy, did not continue laying until the Friday following. Generally speaking, but not uniformly so, the batches were laid almost at the base of the leaf. —J. W. H. HARRISON, B.Sc. *October 2nd*, 1905.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*October 5th*, 1901.—MELANOCHROIC SPECIMEN OF CATOCALA NUPTA: Exhibited by Mr. A. Rose, taken in a garden at Hornsey. The hindwings dull-brown; the markings of the forewings strongly intensified. COLEOPTERA IN LUNDY ISLAND: Mr. Joy captured 163 species in Lundy Island in three days in August last. Of these *Melanophthalma distinguenda*, Com., a species new to Britain; *Stenus ossium* var. *insularis*, a newly-discovered form, a series of *Psylliodes luridipennis* and *Ceuthorrhynchus contractus* var. *pallipes*, a variety peculiar to the island, were the most interesting of the species exhibited. ARGYRESTHIA ILLUMINATELLA NEAR HAILSHAM: Four speci-

mens of this rare species were taken off *Pinus* by Mr. Sich, near Hailsham, on June 15th of this year. Two of these were exhibited. PLEBEIUS ARGUS (ÆGON) VAR. HYPOCHIONA: Specimens exhibited by Mr. A. H. Jones from the Kent downs, taken this year. They are larger and brighter than the heath form, with a narrower border on upperside of forewings, and a paler and brighter ground-colour to the underside. HAMMERSCHMIDTIA FERRUGINEA AT NETHY BRIDGE: Col. Yerbury exhibited 3 ♂ s and 3 ♀ s taken this year at rest on aspen logs; the first authentic British examples. MICRODON LATIFRONS AT NETHY BRIDGE: Also one specimen of this species taken June 19th, 1900 (wrongly identified and recorded as *M. derius*), and another taken this year. Only four British examples are known. CHAMÆSYOPHUS SCÆVOIDES AND CYMORRHINA FALLAX IN SCOTLAND: Specimens of the former taken June 15th, 1905, in Abernethy Forest, also examples of the latter taken in numbers at Nethy Bridge, the same month, were exhibited by Col. Yerbury. *October 18th*, 1905.—EREBIA LEFEBVREI AND ITS ALLIES.—Mr. Rowland-Brown exhibited *E. lefebvrei* (once supposed to be the Pyrenean form of *E. melas*) and var. *pyrenaea*, captured on Mt. Canigou in the E. Pyrenees, also var. *intermedia* from Gavarnie. For comparison he showed *E. glacialis* var. *nicholli* from Campiglio, at one time confused with *E. lefebvrei*, and also referred to *E. melas*. Dr. Chapman handed round a diagram of the genital clasps of ♂ *E. lefebvrei* and *E. melas*, and pointed out that those of *E. lefebvrei* approached those of *E. pronoe* and *E. neoridas*, whilst those of *E. melas* were practically identical with those of *E. nerine*. EREBIA GORGONE AND E. GORGE.—Mr. Rowland-Brown also showed *E. gorgone* and *E. gorge* from the Lac de Gaube, Cauterets and Gavarnie. He pointed out that whereas *E. gorge* appeared to be confined to the stony detritus just below the snow line, where it flew with *E. lefebvrei*, *E. gorgone* was found on the green pastures at an altitude of only about 6000ft., at which elevation it occurred in some numbers on July 23rd, 1905, in the Val d'Estaubé. Dr. Chapman drew attention to the remarkable superficial resemblance of the underside of ♀ *E. gorgone* to that of *E. goante*, a species not hitherto recorded from the Pyrenees. POLYOMMATUS ORBITULUS, P. VAR. OBERTHUERI, AND P. PYRENAICA.—Mr. Rowland-Brown exhibited specimens of *P. orbitulus* from the central Alps and Pyrenees, and its var. *oberthueri* from the central Pyrenees, and observed that *P. orbitulus* from the Col de Paymorens closely resembled the central Alpine form, whilst those from Gavarnie and the Lac de Gaube were the darker and more robust var. *oberthueri*. In exhibiting *P. pyrenaica* and *P. orbitulus* (from the Pyrenees) and *P. pheretes* (from the Tyrol) he remarked that there was shown a greater superficial affinity between *pyrenaica* and *pheretes* than between *pyrenaica* and *orbitulus*. At Gavarnie ♂ s of the two-last named were flying together the last week of July, ♀ s apparently not emerged. APION LEVIGATUM IN LOWESTOFT DISTRICT.—Eight specimens of this rare *Apion* were exhibited by Mr. Bedwell, taken August 31st, under plants of *Echium vulgare*. One ♂ measured only 1¼mm. Mr. Walker said that one example was taken at Oxford this year. HELICONIUS NUMATA.—Mr. Kaye exhibited a long variable series of this species from the Pataro river (British Guiana), the series clearly proving that many forms described as subspecies by Riffarth, Weymer, etc., were here merely aberrations. LEPIDOPTERA AT MAJORCA.—Mr. A. H. Jones exhibited lepidoptera taken in Majorca

during the first half of June, only 13 species of butterflies and 6 moths were observed, the latter included *Peridroma saucia*, *Acidalia ochrata*, and *A. degeneraria*, the latter much redder than British specimens.

LANCASHIRE AND CHESHIRE ENTOM. SOCIETY.—*October 16th*, 1905. —EXHIBITS OF LEPIDOPTERA: Mr. W. A. Tyerman, a bred series of *Pyrameis cardui* from Waterville (Ireland). Mr. F. Pierce, a series of aberrations of *Abraxas grossulariata*, from Wallasey. Mr. W. Mansbridge, a bred series of *Peronea permutana*, *P. aspersana* and *P. hastiana* from Wallasey, *Catoptria expallidana* from Wallasey, *Paedisca corticana*, a variable series, from Delamere, and *Ephippiphora populana* from Crosby. Mr. R. Wilding, *Polia chi* from Montgomeryshire. Mr. C. P. Johnson, dark aberrations of *Macaria liturata*, from Delamere, one black, and an asymmetrical aberration of *Abraxas grossulariata*, from a Stockport larva, a bred series of *Acronycta leporina*, with dark and suffused specimens, from Rixton Moss, and *Boarmia repandata* and *Acidalia contiguaria* from North Wales. Mr. G. L. Cox, *Toxocampa pastinum*, *Acidalia rubiginata*, *Dicycla oo* with ab. *renago*, *Hadena atriplicis*, *Cymatophora octogesima* and *C. or* from Hunts. Mr. J. E. Robson, *Leucania albipuncta* from Bournemouth, and *Xylomiges conspicillaris* from Taunton. Dr. Cotton, *Anthrocera purpuralis* and *Cucullia chamomillae* from Abersoch, and a banded specimen of *Noctua festiva* with dark margins. Mr. F. C. Thompson, series of *Tapinostola fulva*, *Eupithecia venosata*, and *Chortodes arcuosa* from Eccleston. Mr. R. Tait, Junr., bred series of *Angerona prunaria*, *Pericallia syringaria* and *Lachneis lanestris* from Monkswood, *Acidalia contiguaria* and *Agrotis ashworthii* from North Wales, *Melanippe rivata* and *M. procellata* from Sidmouth. Mr. B. H. Crabtree, a bred series of *Agrotis ashworthii* and *A. agathina*, from North Wales, *Odontopera bidentata* ab. *nigra*, and *Dianthoecia cucubali*, from Manchester, *Hydrelia unca* from Ulverston, and *Brenthis selene* from Windermere. EXHIBITS OF COLEOPTERA: Mr. J. F. Dutton, a collection made by Mr. G. Ellison at Stromness, including a melanic form of *Anchomenus parumpunctatus*, *Donacia discolor*, *Chrysomela sanguinolenta*, *Otiorhynchus blandus*, *O. maurus*, and *Ptinus tectus*. Dr. H. H. Corbett, a collection from Doncaster, and sub-fossil remains of *Hydrophilus piceus* from the peat of Hatfield Moor. Mr. J. R. le B. Tomlin, *Psylliodes luridipennis* and *Ceuthorhynchus contractus* var. *pallipes*, from Lundy Island, and *Anophthalmus gentilei*, a blind species from caves in North Italy. LIFE-HISTORY OF TSETSE FLY: Mr. R. Newstead, on behalf of the Liverpool School of Tropical Medicine, exhibited the life-history of the Tsetse fly, *Glossina palpalis*, also living pupæ of this species, and of *G. fusca*, all from Kasonga (Upper Congo). ISCHNURA PUMILIO: Mr. W. J. Lucas sent a pair of the rare dragonfly, *Ischnura pumilio*, from the New Forest. ARADUS DEPRESSUS: Mr. Oscar Whittaker, a scarce Hemipteron, *Aradus depressus*, taken at Pettypool by Dr. C. R. Billups. TRICHOPTERA: Dr. R. T. Cassal sent specimens of the very rare *Limnophilus elegans*, from the Isle of Man. FORFICULIDÆ: Mr. E. J. B. Sopp, *Forficula lesnei*, taken on yellow-horned poppy at Swanage, *F. pubescens* and *Ectobia panzeri*, with egg-capsules, from St. Alban's Head.

CURRENT NOTES.

Part I of the new work, *A Natural History of the British Butterflies, their world-wide Variation and Geographical Distribution*, was published

on November 1st. Price 1s. net. It contains four pages of the preliminary general chapters, including "General Observations on Butterflies," and part of a chapter on "Egglaying of Butterflies." These general chapters are evidently calculated to occupy 80 pages (4 pages in each of 20 parts), the systematic work beginning at p. 81. Twenty-four pages of this systematic work follows, including a full account of the superfamily *Urbicolides* (*Hesperiides*), the family *Urbicolidae*, and the subfamily and tribe *Thymelicinae* and *Thymelicidi*. This is followed by an account of the genus *Adopaea*, a full account of *Adopaea lineola*, under the titles of "Synonymy," "Original description," "Imago," "Sexual dimorphism," "Gynandromorphism," "Variation," "Egg-laying," "Ovum," "Comparison of eggs of *A. lineola* and *T. acteon*," "Habits of larva," "Ontogeny of larva," "Larva," "Foodplants," "Puparium," "Pupa," "Time of appearance," "Habits of imago," "Habitat," "British localities," and "Distribution." Of these details there are, included in the variation of the species, descriptions of the various races and forms that have either come under the author's observation or been culled from the various authorities, whilst the study of the egg, quite unique in its character and upsetting all previous notions of butterfly eggs, is remarkable as well as interesting. As before the author has been able to retain the aid of Dr. Chapman, Mr. Bacot, Mr. Sich, and others for the biological sections, Mr. Prout for the synonymy, Mr. S. Edwards for the literature, whilst Mr. Smallman has most industriously collected some hundreds of lists from lepidopterists in various parts of the United Kingdom, which give a good idea of the actual localities, and Messrs. Gillmer and Rowland-Brown have given considerable help in the distribution. We understand Part II will be published with the November part of this magazine, and will be continued monthly. The Rev. G. H. Raynor has kindly undertaken the final indexing. It is printed in the same style and is intended to match exactly the volumes of *The Natural History of the British Lepidoptera*, the fifth of which is being pushed forward as fast as the exigencies of printing will allow. Readers of *The Ent. Record* can obtain Part I or II post free by sending 1s. 1d. in stamps to Mr. J. Herbert Tutt, 119, Westcombe Hill, S.E. Parts I and II together will give a capital idea of the scope of the work.

The *Proceedings of the Cleveland Naturalists' Field Club*, vol. ii., pt. 1 T. Woolston, Publisher, etc., Middlesborough, contains an interesting paper by Mr. T. A. Lofthouse, "Cleveland Lepidoptera in 1903 and 1904," and another by Mr. Lawson Thompson, F.E.S., "Report on the Coleoptera observed in Cleveland."

We regret to announce the death of Mr. Ambrose Quail, at Tamworth, New South Wales, on February 11th last, at the age of 33 years, which has only just come to our knowledge. Commencing his entomological career as an active member of the City of London Entom. Society, he was obliged, on account of his health, to go to New Zealand, where he resided for some years, returning to Queensland after a short visit to England in the autumn of 1903, and going on thence to New South Wales, where he had only resided some six months at the time of his decease.

Mr. Carl Frings has renamed (*Societas Entomologica*) *Lasiocampa quercus* ab. *olivaceo-fasciata*, Cockerell, calling it ab. *paradoxa*. The form is described in some detail *Nat. Hist. Brit. Lep.*, vol. iii.

June 1st has always been a red letter day with me, and this year it proved no exception. I had determined to give Niederneundorf a visit, as it was at this place the previous year that I had taken *Melanippe unangulata* and *Collix sparsata*, both very good insects in Germany, and much sought after. I, however, made a start from Spandau, so as to work the bilberry. The first alder wood produced fine freshly-emerged specimens of *Hypsipetes impluviata*, in my opinion, one of the most beautiful carpets. After boxing several from tree-trunks, and passing over worn and fresh *Tephrosia punctularia* in numbers as unworthy of notice, I arrived at the pinewoods, with their undergrowth of bilberry, and immediately set to work collecting a fine long series of *Acidalia fumata*, which I had overlooked the previous year, taking it for *A. remutata*: the latter was also in evidence, but not nearly so common as *A. fumata*; besides these, *A. aversata* (rather early), *Timandra amata*, *Zonosoma pendularia*, *Z. punctaria*, *Lythria purpuraria*, and *Thalera putata* were fairly frequent, and *Euclidia mi* and *E. glyphica* a perfect nuisance. On getting out more into the open, *Erastria deceptoria* was found flying about in the sunshine, and four fine specimens boxed, *Bupalus piniarius* and *Ematurga atomaria* were as abundant as usual, the former already worn. In a piece of swampy alder wood, where the yellow iris was in bloom, *Phasiane petraria*, *Cabera pusaria*, *C. exanthemaria*, *Eupisteria heperata*, and *Asthena luteata* were not uncommon, *Melanippe sociata* and *M. montanata* perfect pests. Here also a solitary specimen of *Eupithecia trisignaria* was found. Various additions were made to the bag before Niederneundorf was reached, amongst others *Boarmia consortaria*, *Tephrosia luridata*, *T. crepuscularia*, *Moma orion*, *Acronycta aceris*, *Eurymene dolabraria*, etc., but the most noteworthy incident occurred in a small clump of hornbeam and birch, numbering altogether about 40 trees. The trunks were simply smothered with moths, chiefly *Cidaria corylata*, *Eupithecia dodoneata*, *Tephrosia luridata* and *Hypsipetes impluviata*, and on one trunk alone I counted 27 specimens of *Cidaria corylata*, 3 *Eupithecia dodoneata*, and 1 *Hypsipetes impluviata*. It would have been easy to have taken 500 specimens of *C. corylata* from this plantation.

Arrived at Niederneundorf I found Herr Zobel, who had come by boat, and who was busily engaged in capturing *Cyclopides sylvius*, but they were mostly over. I captured thirteen specimens in the course of half-an-hour, but none were worth keeping. The famous strip of wood was, as usual, so full of moths that one did not know what to catch; however, my particular quarry was *Melanippe unangulata*, but it was not as common as the previous year, and I had to work hard to get fourteen specimens. *Pechipogon barbalis* was in grand condition, and, amongst the countless profusion of common Geometrids, I found several *Macaria alternata*, *Lobophora viretata*, etc. It is quite impossible to give any idea of the boundless profusion of small moths in this wood. At every step one takes, the vegetation is alive with them. Every treetrunk has them dotted all over it, and it is difficult to follow one particular specimen owing to the numbers that get in its path. Owing to this, many *Melanippe unangulata* escaped a premature death. The chief species are *Melanippe sociata*, *M. montanata*, *M. unangulata*, *Cidaria truncata*, *Coremia ferrugata*, *C. unidentaria*, *Melanthia albicillata*, *Melanippe tristata*, *Eupisteria obliterata*, *Asthena luteata*,

Subscriptions not yet forwarded should be sent without delay (and so save time and correspondence) to **J. Herbert Tutt, 119, Westcombe Hill, S.E.** Will subscribers please oblige?

Non-receipt or errors in the sending of Subscribers' magazines should be notified to **Mr. H. E. Page, "Bertrose," Gellatly Road, Hatcham, S.E.**

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The **Back Volumes** (I-XVI) of *The Entomologist's Record, &c.*, can be obtained at 10s. 6d. per Volume. Complete set of 16 vols. £6 2s. 6d. net. "**Special Index**" to Vols. III., IV., V., VI., VII., VIII., IX., X., XI., XII., XIII., XIV., XV. and XVI., price 1/6 each. **Single Back Numbers** can be obtained at double the published price from **J. Herbert Tutt, 119, Westcombe Hill, Blackheath, S.E.**

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Advertisements of **Books and Insects for Sale** will be inserted at a minimum charge of 2s. 6d. for four lines. Larger Advertisements in proportion. A reduction made for a series. Particulars of **Mr. J. Herbert Tutt, 119, Westcombe Hill, Blackheath, S.E.**

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Articles for Insertion and Exchanges should be sent to J. W. Tutt, Rayleigh Villa, Westcombe Hill, S.E., except those relating to Coleoptera, which should be sent to Mr. H. Donisthorpe, 36 Kensington Mansions, South Kensington, S.W.

All **Exchange Magazines** must be forwarded to J. W. Tutt, Rayleigh Villa, Westcombe Hill, Blackheath, S.E.

Reprints of Articles or Notes (long or short) appearing in this Magazine can be arranged for by Authors at a very low price, if ordered at the time of sending the article (minimum 50), on application to Mr. J. Herbert Tutt, 119, Westcombe Hill, Blackheath, S.E.

Exchange.—*The use of this column for the offer of Duplicates and Desiderata and Changes of address is open free to subscribers so far as there is space available.*

Desiderata.—Cicindelidæ (Tiger Beetles) of the entire globe desired, in exchange for insects of North America. I offer many of our rarest species in first-class condition.—*H. F. Wickham, State University, Iowa City, Iowa, U.S.A.*

Duplicates.—Aglaia, Minima, Ægon, Villica*, Umbratica*, Fimbria*, Palmia, Abjecta (fair), Putris, Procellata, Illunaria*, pupæ S. ligustri, larvæ Sambucaria. *Desiderata.*—Batis, Urticæ, Velleda, Hectus, Dispar, Chlorana, Russula, Fasciline, Cratægi, Lanestris, Trifolii, Quercifolia, Furcula, Zicznc, Flavicornis, Ridens, and others to renew.—*T. G. Foreman, The Studio, High Street, Halling, Rochester, Kent.*

Duplicates.—Pupæ: Ruberata, Impluviata; Imaginæ: Adippe, Selene, Ægon, Corydon, Bellargus, Paphia and var. Valezina, Polychloros. *Desiderata.*—Half-a-dozen specimens each of Machaon, Sinapis, Cinxia, Aihalia, Aurinia, C-album, Blandina, Epiphron, Ægeria, Davus, Pruni, Arion, Pattiscus, and a pair of any Sphingid or Notodontid, or offers in early stages.—*(Miss) C. Henderson, Chester Moor Infant School, Chester-le-Street.*

Duplicates.—Fine Rup. extensaria*. *Desiderata.*—Empyrea, Consignata, Lapidata, Conspicillaris, Bractea, Peltigera, Armigera, Apiformis, Bombeciformis, Mucorda, Nigrocincta, Fluvista, Tæniata, Degeneraria, Chaonia, Testudo, Pruni, Obliquaria, Nubeculosa, Turca, Leporina, Fluctuosa, Caliginosa, Cannæ, Ashworthii, Lychnitis, Atriplicis, Margaritalis, Myellus, Pulveralis, Marmorea, and other rare or local species. None but well set insects, on black pins, accepted.—*E. A. Atmore, King's Lynn, Norfolk.*

Duplicates.—Atalanta*, Dispar* and ova, Monacha*, Peria, Antiqua*, Filipendulæ*, Cossus, Pallens, Phragmitidis, Lithoxylea, Bicoloria, Vertucci*, Autumnaria*. Preserved larvæ: Cinxia, Urticæ, Jacobæa, Caja, Dispar, Monacha, Antiqua, Bucephala, Unanimis, Pronuba, Xanthographa, Typica, Opima, Lucipara, Oleracea, Verbasci, Autumnaria, Biundularia, Grossulariata. *Desiderata.*—Numerous, or land, freshwater, or marine shells.—*J. W. Boult, 50, Washington Street, Newland, Hull.*

Wanted.—Correspondence with Lepidopterists and Hymenopterists in Canada, United States, and Germany, with a view to exchange of specimens and mutual help.—*J. W. H. Harrison, B.Sc., The Avenue, Birtley R.S.O., Durham, England.*

Wanted badly.—A pupa or pupa-skin of *Tages*. Preserved will do. This is wanted to complete figures of the Skippers.—*J. W. Tutt, 119, Westcombe Hill, S.E.*

Wanted.—Ova: I wish to obtain photos of the ova of British lepidoptera. Will anyone having ova of any species, and willing to lend same, send me a list on postcard? I will undertake to return complete and undamaged as quickly as possible, and willingly pay postage.—*Alfred E. Tunge, "Aincroft," Reigate, Surrey.*

Wanted.—British and European Tortricids, especially those species credited to both Europe and America in Meyrick's *Handbook* and Staudinger and Rebel's *Catalog*, pinned and set in English style acceptable. Will make liberal returns in any family of North American Lepidoptera natural or other orders unnamed.—*W. D. Kearfott, 118, Liberty Street, New York City, U.S.A.*

WANTED COLEOPTERA.—As I wish to breed and record the life-history of all the species of *Coleoptera*, I should be pleased to receive any cases and living larvæ which entomologists may meet with. I will do what I can in return.—*Hy. J. Turner, 98, Drakefell Road, St. Catherine's Park, New Cross, S.E.*

EXCHANGE.—I am desirous of obtaining butterflies from the Malayan Archipelago, and the Pacific Islands. For such I offer perfect diurnals from North and South America, North American Coleoptera.—*Levi W. Mengel, Boys' High School, Reading, Pa., U.S.A.*

WANTED.—Erycinidæ of the world. Offer for same Diurnl from United States.—*Levi W. Mengel, Boys' High School, Reading, Pa., U.S.A.*

WANTED.—Parasites from British Coleoptera. Beetles infested with *Gordius*. Any material will be gratefully acknowledged.—*H. St. J. K. Donisthorpe, 58, Kensington Mansions, S.W.*

PARASITICAL DIPTERA WANTED.—Will lepidopterists who may breed any dipterous parasites from larvæ or pupæ kindly forward such as they do not require to me? If so I shall be greatly obliged.—*C. J. Wainwright, 2, Handsworth Wood Road, Handsworth, Staffs.*

MEETINGS OF SOCIETIES.

Entomological Society of London.—11, Chandos Street, Cavendish Square, W., 8 p.m. Meetings: November 15th; December 6th, 1905. Annual meeting, January 17th, 1906.

The City of London Entomological and Natural History Society.—London Institution, Finsbury Circus, E.C.—The first and third Tuesdays in the month, at 7.30 p.m., except in July and August. November 21st, "A new Index Entomologicus," by Rev. G. H. Raynor, M.A. December 5th, Presidential Address; December 19th, "The *Rhemaptera hastata* group," by L. B. Prout.

Toynbee Hall Natural History Society.—Held at Toynbee Hall, Commercial Street, E., Mondays, at 8 p.m. December 4th, "Natural History of a Salt-marsh," A. G. Tansley. Field Meetings.—November 19th, Chalfont Road, train 10·44 a.m. from Baker Street. January 8th, 1906, Presidential Address.

The South London Entomological and Natural History Society, Hibernia Chambers, London Bridge.—The second and fourth Thursdays in each month, at 8 p.m. November 23rd, "Special Exhibition of Varieties." December 8th, Lantern Slides.

North London Natural History Society, Hackney Technical Institute, adjoining Hackney Downs Stations, G.E.R., at 7.45 p.m. The 2nd and 4th Tuesdays in the month. November 14th, "Lepidoptera, Enemies and means of Defence," M. F. Hepburn, F.L.S., etc. November 21st; 28th, "Natural Perfumes from Animals and Plants." December 5th; 12th, Exhibition of Lantern Slides; 19th.

Lancashire and Cheshire Entomological Society.—Hon. Sec., E. J. B. Sopp, 104, Liverpool Road, Birkdale. From whom all necessary information can be obtained.

Birmingham Entomological Society, Norwich Union Chambers, Congreve Street, at 8 p.m. November 20th; January 15th; February 19th (annual).

The British Noctuæ and their Varieties.

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These four volumes comprise the most complete text-book ever issued on the NOCTUIDES. The work contains critical notes on the synonymy, the original type descriptions (or descriptions of the original figures) of every British species, the type descriptions of all known varieties of each British species, tabulated diagnosis and short descriptions of the various phases of variation of the more polymorphic species; all the data known concerning the rare and reputed British species. Complete notes on the lines of development of the general variation observed in the various families and genera. The geographical range of the various species and their varieties, as well as special notes by lepidopterists who have paid particular attention to certain species.

Each volume has an extended introduction. That to Vol. I deals with "General variation and its causes"—with a detailed account of the action of natural selection in producing melanism, albinism, etc. That to Vol. II deals with "The evolution and genetic sequence of insect colours," the most complete review of the subject published. That to Vol. III deals with "Secondary Sexual Characters in Lepidoptera," explaining so far as is known, a consideration of the organs (and their functions) included in the term. That to Vol. IV deals with "The classification of the Noctuæ," with a comparison of the Nearctic and Palæarctic Noctuides.

The first subscription list comprised some 200 of our leading British lepidopterists, and up to the present time some 550 complete sets of the work have been sold. The treatise is invaluable to all working collectors who want the latest information on this group, and contains large quantities of material collected from foreign magazines and the works of old British authors, arranged in connection with each species, and not to be found in any other published work.

tibiæ. Length of body, 35mm. ♀; of pronotum, 10mm. ♀; of elytra, 6mm. ♀; of post-femora, 15·5mm. ♀.

Spain: Aranjuez, Loca, Cartagena, Orihuela.

4. PAMPHAGUS MONTICOLA, Rambur.

Length of body, 21mm. ♂, 50mm. ♀; of pronotum, 6mm. ♂; of elytra, 4mm. ♂; of post-femora, 11mm. ♂.

Spain: supposed to be peculiar to the Sierra Nevada, but recently taken in Siles in the Sierra de Alcaraz; the record from Chiclana is a typographical error.

5. PAMPHAGUS PUNCTATUS, Bolivar.

Allied to the preceding, but larger, and smoother, with small impressions.

Length of body, 30mm. ♂, 55mm. ♀; of pronotum, 8mm. ♂, 11mm.-12mm. ♀; of elytra, 7mm. ♂, 8mm.-9mm. ♀; of post-femora, 14mm. ♂, 17mm.-18mm. ♀.

Spain, recently discovered at La Sagra and Santiago de la Espada in July. Allied to *P. monticola*.

6. PAMPHAGUS HESPERICUS, Rambur.

This is the largest Spanish species; it is distinguished from all the others by its rough dorsal surface.

Length of body, 35mm. ♂, 75mm. ♀; of pronotum, 8mm. ♂, 18mm. ♀; of elytra, 9mm. ♂, 14mm. ♀; of post-femora, 20mm. ♂, 28mm. ♀.

Spain, Malaga. Also in Algeria.

7. PAMPHAGUS DECEPTORIUS, Bolivar.

Distinguished by its small size, rough over surface, black and white marbling and feebly arched pronotum. Length of body, 29mm. ♂, 35mm. ♀; of pronotum, 5·2mm. ♂, 7mm. ♀; of elytra, 5·7mm. ♂, 6mm. ♀; of post-femora, 12mm. ♂, 14mm. ♀.

Centre and south of Spain: Burgos, Albarracin, Uclès, Valencia; adult in July and August.

8. PAMPHAGUS MABILLEI, Bolivar.

Smaller than *P. hespericus*, but larger than *P. deceptorius*. Length of body, 40mm. ♂, 50mm. ♀; of pronotum, 7mm. ♂, 11mm. ♀; of elytra, 9mm. ♀; of post-femora, 14mm. ♂, 21mm. ♀.

Spain: Valencia, Ciudad Real, Benifayo, Cerratraca, Malagon near Toledo; in October.

9. PAMPHAGUS SIMILLIMUS, Yersin.

Distinguished by the form of the prosternum, which has the anterior margin produced into a tooth. Length of body, 29mm.-33mm. ♂, 52mm.-58mm. ♀; of pronotum, 6·5mm.-7mm. ♂, 10mm.-11·5mm. ♀; of elytra, 6mm. ♂, 7·7mm.-9mm. ♀; of post-femora, 15mm.-16mm. ♂, 20mm.-22mm. ♀.

Sicily: Palermo, Siracuse.

10. PAMPHAGUS EXPANSUS, Brunner.

Differs from the preceding in the higher and more arched crest of the pronotum, slightly longer elytra and rounded margin of the prosternum. Length of body, 35mm. ♂, 50mm. ♀; of pronotum, 7.8mm.

♂, 11·3mm. ♀; of elytra, 5·5mm. ♂, 8·5mm. ♀; of post-femora, 16mm. ♂, 23mm. ♀.

Spain: Gibraltar, Algeciras. Also in Algeria.

(*To be continued.*)

COLEOPTERA.

Notes on further additions, etc., to the Coleoptera of the Northumberland and Durham district.

By RICHARD S. BAGNALL, F.E.S.

Owing to our northern counties having been so well worked by Messrs. Bold and Hardy, almost any addition is sure to be (to some, at least) of more than ordinary interest, and with this idea in view I have pleasure in recording some recent additions. The species obtained by Mr. Gardner were mostly captured by sweeping the railway embankments near Hartlepool, and were amongst a parcel he sent me of very interesting, but undetermined, beetles. Before commencing I would acknowledge my indebtedness to Messrs. Donisthorpe and Newbery for the more than kindly help they have given me in identifying and confirming the identification of the more difficult species. NEBRIA GYLLENHALI, Sch., var. RUFESCENS, Stroem.—Derwent Valley, etc. AMARA ANTHOBIA, Villa.—Mr. Willoughby Ellis records the capture of one example at Hartlepool, May, 1892 (*Ent. Mo. Mag.*, 1905, p. 161, Rev. G. A. Crawshay). To what extent this new British beetle occurs at Hartlepool, I do not yet know, but hope shortly to examine Mr. Gardner's series of the allied species, *A. familiaris* and *A. lucida*. ANCHOMENUS GRACILIS, Gyll.—Near Burnopfield. AGABUS CONSPERSUS, Marsh.—In a pond near Winlaton. PLATAMBUS MACULATUS, L., var. IMMACULATUS, Donis.—I have taken a few of this form unaccompanied by type from a stream running into the Derwent at Gibside. CERCYON LITTORALIS, Gyll., var. BINOTATUM, Steph.—Rare, with type at Roker. Mr. Routledge has taken it at Long Houghton, near Alnwick. LEPTUSA ANALIS, Gyll.—I took two examples of this Scotch "staph" at Egglestone, in Teesdale, June, 1905. CONOSOMA PEDICULARIUM, Gr.—By sweeping, South Hylton, June, 1905. MEGACRONUS INCLINANS, Gr.—One specimen from beneath a log of oak, Gibside, October, 1905. HETEROTHOPS DISSIMILIS, Gr.—By sweeping near Winlaton Mill, June. QUEDIUS LONGICORNIS, Kr.—This very rare *Quedius* has been taken at Hartlepool and in Teesdale by Mr. Gardner, and has occurred to me in the Derwent Valley, June. QUEDIUS MICROPS, Gr. (CHRYSURUS, Kies.).—One example from Gibside. QUEDIUS OBLITERATUS, Er.—I am very glad to give this species—added to the British catalogue by Mr. Keys two years ago—a place in our list. Mr. Donisthorpe netted an example on the wing at Gibside, this October. Curiously enough, I had taken the true *Q. suturalis*, Kies., in the same district. QUEDIONUCHUS LÆVIGATUS, Gyll.—Professor Beare and I took this Scotch species from beneath beech bark, Gibside, in June, 1905. I had the species unrecognised in my collection, and have since taken a nice series and larvæ—all from under *beech* bark. Owing to its occurring exclusively from pine and fir bark both in Scotland and on the continent, I may have more to say about the Gibside capture. CAFIUS XANTHOLOMA, Gr., var. VARIOLOSUS,

Shp.—With type, but much rarer; Newbiggin, Whitley, and Roker. XANTHOLINUS LONGIVENTRIS, Heer.—Gibside. LATHROBIUM LONGULUM, Gr.—Gibside. L. FOVULUM, Steph. (PUNCTATUM, Brit. Cat.).—Gibside in October, and Norman's Riding, near Winlaton, May. CRYPTOBIUM GLABERRIMUM, Hbst.—Near Winlaton, February. LESTEVA PUBESCENS, Man.—One example from under a chip of wood lying beneath a small waterfall, Gibside, November, 1905. I have now local records of all our British species of *Lesteva*. HOMALIUM BREVICORNE, Er.—Mr. Donisthorpe took a *Homalium* apparently referable to this very rare species in Gibside this October, and has sent it to M. Fauvel for his opinion. Hardy records it from the Wooler district. LEPTINUS TESTACEUS, Müll.—I found a solitary example in a rotten oak branch, Gibside, September, 1905. It resembled a bug so much both in form and agility that I very nearly passed it. AGATHIDIUM BADIUM, Er.—It is with real pleasure I am able to record this species from Gibside, and to Mr. Donisthorpe, who took an example whilst staying with me this October, I am indebted for pointing out the species. It occurs exclusively beneath beech bark, except in the summer, when I have found it in a tree-growing fungus. Dr. Chaster took a single example at Patterdale, and added it to the British list last year (*Ent. Rec.*, 1904, p. 18). NECROPHORUS VESTIGATOR, Hers.—Taken by Mr. Robson at Birtley. CHOLEVA SPADICEA, Stm.—Near Marley Hill, above Gibside. PTERIX SUTURALIS, Heer.—This September I took a number of this tiny beetle from under the bark of a small decayed beech branch. TRIPLAX BICOLOR, Gyll.—In March I found both the larvæ and the pupæ (apparently both new to science) of this recent addition to our beetle fauna. CERYLON FAGI, Bris.—Another example from beneath beech bark in Gibside. C. FERRUGINEUM, Steph.—Beneath beech bark; Gibside, very plentiful; Hylton and Egglestone, in Teesdale, rare; Winlaton Mill, a number from a rotten oak stump. RHIZOPHAGUS PERFORATUS, Er.—Further examples from Gibside. LATHRIDIUS ANGULATUS, Man.—Rare; by sweeping in the Derwent Valley and Weardale. ATOMARIA FIMETARII, Hbst.—Gibside, in a small fungus. EPHISTEMUS GYRINOIDES, Marsh., var. DIMIDIATUS, Stm. CORYMBITES QUERCÛS, Gyll., var. OCHROPTERUS, Steph.—Rare with us; Gibside and South Hylton. GEOTRUPES VERNALIS, L.—Near Marley Hill. CIS NITIDUS, Hbst.—Gibside and Egglestone in Teesdale. CHRYSOMELA ORICHALCIA, Müll., var. HOBSONI, Steph.—Extremely local. South Hylton in August (*Ent. Record*). LONGITARSUS ANCHUSÆ, Pk.—Gibside, rare. L. OCHROLEUCUS, Marsh.—This has occurred to me plentifully by evening sweeping in a certain cornfield near Hylton (June, 1905), whilst *L. luridus*, Scop., also recorded by Bold as rare, has been very common at Gibside, Castle Eden Dene, Teesdale, etc., this year. PHYLLOTRETA ATRA, Pk.—One specimen taken by Mr. Gardner, at Hartlepool. P. CRUCIFERÆ, Goeze.—By sweeping, Hartlepool (Gardner) and Derwent Valley. MANTURA RUSTICA, L., var. SUTURALIS, Weise.—Gibside and South Hylton. M. MATTHEWSI, Curt.—Two examples taken by Mr. Gardner at Hartlepool. PSYLLIODES CHALCOMERA, Ill.—Hartlepool. One specimen only (Gardner). P. HYOSCYAMI, L.—Hartlepool, one specimen only. Hartlepool (Gardner). I verified its identity by comparison with types which Commander Walker kindly gave me. ANASPIS GEOFFROYI, Müll., var. SUBFASCIATA, Steph.—By beating hawthorn in June, at Egglestone in Teesdale. RHYNCHITES ÆQUATUS, L.—

I took a small series of *R. aequatus* at Winlaton Mill in the spring of 1903. R. ÆNEOVIRENS, March.—Winlaton Mill and Gibside. APION GENISTÆ, Kirb.—Winlaton Mill. A. HYDROLAPATHI, Kirb.—Gibside, Hylton, etc. ERIRHINUS SCIRPI, F.—I took a single specimen clinging to a stone beneath high water mark, this spring, on the Wear, near Hylton, and by repeatedly sweeping at the same locality, took two more the following week. DORYTOMUS MELANOPHTHALMUS, Pk.—Below Axwell Park and at Winlaton Mill, autumn. The var. *agnathus*, Boh., occurs with the type. CRYPHALUS TILIÆ, Pz.—One example taken by Mr. Gardner, at Hartlepool or in Teesdale. Probably introduced. DRYOCÆTES AUTOGRAPHUS, Ratz.—One example by sweeping a small firwood in Gibside. It has evidently not hitherto been taken in any other locality than Scarborough, when it was found in 1869. D. ALNI, Georg.—A few from beneath bark of a fallen beech in a wood above Winlaton Mill, autumn, 1904. TOMICUS SEXDENTATUS, Börn. T. TYPOGRAPHUS, L.—Both these very rare Scolytids were amongst Mr. Gardner's unnamed beetles, but owing to them being without data, I prefer for the present to regard them as introduced. T. ACUMINATUS, Gyll.—One example by sweeping at Offerton, near Hylton, spring, 1905.

PTINUS LATRO, F., IN LONDON.—Last May I took a *Ptinus* in the bath in my bath-room at 58, Kensington Mansions, which at the time I took to be ♀ *P. fur*, but on comparing it with that species I found the shape to be different and the antennæ shorter, besides the fact that it has no white markings. It agrees exactly with a foreign specimen of *P. latro* possessed by Mr. Bates. Of this insect Fowler writes: "In old houses, especially in store rooms; two examples in Mr. Waterhouse's collection, one from old collection with no history, and the other labelled 'Scotland, Turner.'" These appear to be the only British records! I may say that *Niptus hololeucus* occurs regularly every year in my flat, and I often find specimens in the bath. They no doubt come from the woodwork of the bath.—HORACE DONISTHORPE.

ON A FLIGHT OF RHIZOTROGUS SOLSTITIALIS, L.—In July last, when I was staying with Mr. E. A. Waterhouse, near Sandwich, we noted the evening flight of *Rhizotrogus solstitialis*, L. Towards dusk, along about two miles of road, they were in countless thousands, flying over the top of a small fir wood, over a cornfield, and round the telegraph poles and wires; they also flew against, and settled on, us. On our way home we saw a single large bat flying in the direction from whence we had come. The next night we went to see if the same thing occurred again, and found hundreds of these big bats chasing and catching the beetles in the air, though they often missed them. A hedgehog, too, was picking up those that fell to the ground. On the third night there was not a single beetle to be seen.—IBID.

NOTES ON COLLECTING, Etc.

LITHOSIA SOROREULA (AUREOLA) NEAR STROUD.—A specimen of this uncommon species, in fine condition, was found resting on a leaf of *Mercurialis perennis* (Dog's Mercury), in the Stroud district during the

evening of May 18th last, by Mr. W. B. Davis, who kindly sent it to me for inspection, as it was the first Gloucestershire example we had seen. Mr. V. R. Perkins, of Wotton-under-Edge, has since informed me that he has two other records for our shire, one taken near Cheltenham and another near Cirencester, but I believe not recently.—C. J. WATKINS, F.E.S., King's Mill House, Gloucester. *November 16th*, 1905.

CUPIDO MINIMA (ALSUS) IN GLOUCESTERSHIRE.—This species is widely distributed, but local on the Cotteswolds, some years occurring very freely in its favourite spots. For example, during the present year it appeared to me to be more numerous than in any previous season I remember, and I have observed this pretty delicate species since 1868, when on July 24th I saw my first specimen at rest, whilst searching for its rarer relation *Lycaena arion*. My earliest record of *C. minima* is on May 27th, 1870, but it was seen in the Stroud district this year as early as May 25th. Mr. Mosley in the *Naturalists' Guide*, 1894, p. 50, states:—"In some parts of the south the caterpillars change to chrysalids as soon as they are fullfed in warm seasons, and there is a second flight of butterflies in August." It may be double-brooded, but I have never met with it so late as August.—IBID.

MELITÆA AURINIA (ARTEMIS) IN GLOUCESTERSHIRE.—This local butterfly has been known to occur for many years past in certain very limited areas in Gloucestershire, chiefly in low-lying damp meadows and marshes in the vales, and, as a rule, these specimens are larger and darker coloured than those found in some other British localities, as Sussex, Cumberland, etc. The late veteran, Joseph Merrin, of Gloucester, collected and bred some remarkable aberrations of this species, some of which I saw in his collection many years ago. A Gloucestershire specimen, now in the collection of Mr. A. B. Farn, has the wings semi-transparent yet possessing the scales. It is irregular in appearance, and some seasons may be absent from a spot in which it appeared the previous year. On June 15th last, in company with Mr. W. B. Davis, of Stroud, we visited a ridge of the Cotteswolds 800 ft. high, on which I had not been for 30 years, and to my friend it was new ground. While resting, discussing our sandwiches and the glorious view of hill and dale towards the Severn, we noticed among the varied insects near us, a dull butterfly of sluggish flight, and somewhat different habit from *Brenthis euphrosyne* usually met with in such spots. On netting it great was our surprise to find we had captured *M. aurinia* at such an elevation. Soon we noticed other specimens, and during the next half hour could have taken dozens had we so wished. It was the first occasion I had seen it on the summit of a Cotteswold hill, but my friend had had a similar experience several years ago and on a similar ridge some miles distant. It is interesting to observe that these hill-top specimens are smaller and of a lighter colour than those usually found in the vales. One is curious to know whether this is a distinct race, and if the eggs are deposited on different species of foodplant from those in the vales. Such observations require more time than I, for one, can at present devote to so fascinating a subject.—IBID.

LYCÆNA ARION IN GLOUCESTERSHIRE.—This, the chief prize of the lepidopterist in our shire, and formerly not uncommon in several local spots, has considerably decreased in numbers in recent years, and so

much so that in most of its former haunts it has disappeared, and we fear that at no distant date it will be sought for in vain in the few and remote places far removed from its former head-quarters, in which it is now sometimes found. We believe the chief cause of this is the very regrettable fact of its having been over collected, hence most of the females get destroyed; also the grand old woods are being removed with the result that timber felling and hauling is continually going on, and these disturbing influences all combine to bring the time when not only *L. arion* will be extinct in our Cotteswolds, but many other less rare species will have died out. Again, in one place in which I used to watch it, buildings have been erected, and in another spot in which I first saw it, quarrying operations are now carried on. All this means new roads made, fresh hauling tracks, the herbage and ants' nests more disturbed, while cattle grazing is on the increase, and most years in early spring the commons and hillsides are often ablaze with burning dry bents set on fire by the village lads (matches are too common in these days of cheap cigarettes). The average of our Cotteswold specimens of *L. arion* are not so large as those I have seen from Devon and Cornwall, or so fine as some I have examined from the Continent.—IBID.

IMMIGRATION OF EUCHELIA JACOBÆÆ.—I feel quite distrustful of myself in calling in question anything which Mr. Harrison writes, but his note upon the above fairly astonishes me. The insect is naturally so lethargic and heavy, that one cannot but think there must be some other explanation of its appearance, in some numbers, near Chester-le-Street. May it not have been a case of cumulative retarded emergences?—(REV.) C. R. N. BURROWS, The Vicarage, Mucking, Stanford-le-Hope. *November* 16*th*, 1905.

PYRAMEIS ATALANTA AND EUCHELIA JACOBÆÆ.—In answer to Mr. Harrison's request (p. 300) I can make the following notes: *P. atalanta* was in profusion at Buckfastleigh, Devon, from end of August till nearly end of September, the specimens being particularly fine in size and condition. *E. jacobaeae*, a few seen for a day or two about July 1st, in same locality, condition rather poor. The larvæ of *E. jacobaeae* were present in large numbers on *Senecio vulgaris*, in two separate lots, one at the beginning of August, and the other at beginning of September; in both cases none being under half-grown. —PHILIP DE LA GARDE, Shaldon, near Teignmouth. *November* 20*th*, 1905.

POLIA CHI IN MONMOUTHSHIRE.—Referring to the Rev. G. H. Raynor's note (*anteà*, p. 295) on the distribution of *Polia chi*, I see he states that the most southerly point of its main habitat in England seems to be in the southwest of Herefordshire, therefore, it may, perhaps, be worth reporting its occurrence still further south in Monmouthshire, at Tintern, where we find both the caterpillars and moths in plenty. I do not remember having seen it noted before, but we have observed that the larvæ, as well as those of *P. flavicincta*, which also occurs here, though less commonly, are more generally to be found on low plants growing by the side of stone walls and buildings, than on those in a more open situation.—J. F. BIRD, The Nurtons, Tintern, Monmouthshire. *November* 16*th*, 1905.

PERIZOMA BIFACIATA (EMMELESIA UNIFASCIATA) FIVE WINTERS IN PUPAL STAGE.—Mr. Prout's note (*ante*, p. 300) reminds me to put on record the

emergence of two imagines of *Perizoma bifaciata* (*unifasciata*), on July 30th and August 5th this year, from pupæ of the autumn of 1900, they thus having remained over five winters as pupæ.—ROBERT ADKIN, F.E.S., Lewisham. *November 19th*, 1905.

MANDUCA ATROPOS IN ESSEX.—A pupa of *Manduca atropos* was brought to me on October 24th from a farm here, discovered by a potato digger. It was the only one found on several acres of potatoes.—E. MILLER, The Croft, Rainsford Lane, Chelmsford, Essex. *November 7th*, 1905.

MANDUCA ATROPOS AT MUCKING.—I have had two larvæ and six pupæ brought to me this autumn. Two of the pupæ were dead. I have so far bred only one imago, on October 1st.—(REV.) C. R. N. BURROWS, The Vicarage, Mucking, Stanford-le-Hope. *November 14th*, 1905.

CIRRHŒDIA XERAMPELINA IN GLOUCESTERSHIRE.—I have taken a good many *Cirrhoedia xerampelina* on the Cotteswold Hills in this neighbourhood, 600 and 700 feet up, and on the slopes of the hills in very dry situations. I have dug the pupa and taken the imago at rest on ash-trunks on the hills.—W. R. BUCKELL, M.D., Fairholme, Montpellier, Cheltenham. *November 5th*, 1905.

UNUSUAL TIME OF EMERGENCE OF HYLES EUPHORBIÆ.—In early August, 1904, when walking up the Saas-Thal, between Balen and Saas, I found a great many larvæ of various sizes of *Hyles euphorbiæ*. Of these some 25 pupated, and the pupæ were kept through the winter in an ordinary living room with a fire. A fair number of well-developed imagines emerged in May and June and two in July, 1905, the last about the 12th. Three living pupæ remained at mid-July when I again went abroad, and the pupæ travelled with me for some five or six weeks in northern Italy, etc., but without emerging. It was, therefore, with some surprise that to-day (November 9th) I found a ♀ from one of these pupæ expanding its wings, and which, with the exception of a slight crinkling of the wings, is perfect and of good size, though poor in colour. One supposes, however, that it was not altogether happy in its emergence at this time, for the prothoracic shield is still adherent to the moth, and I had to lift one of the antennæ from its sheath which was adherent to the prothoracic plate. A pupal period of fifteen months, however, appears to me to be sufficiently unusual to merit notice.—A. M. COCHRANE, Lewisham, S.E. *November 9th*, 1904.

OPORABIA FILIGRAMMARIA IN IRELAND.—On June 11th and 14th, I took larvæ of *Oporabia filigrammaria* feeding on heather on Benaughlin, in co. Fermanagh. Apparently they were nearly over, for most of the larvæ were stung; I only bred one moth, which emerged August 31st. From September 5th to September 11th, I was taking the same species on the Lancashire moors. Returning to Ireland on September 14th, I at once paid a visit to Benaughlin, but failed to find the moth, probably I was too late, as the season was an early one. *O. autumnata*, which occurs in the woods in the same county, is at least a fortnight later. If *O. autumnata* and *O. filigrammaria* are the same species, as I am inclined to believe, we have the curious case of the moorland form of a species appearing earlier than the lowland form. I am told that this is the case with the two forms of *Hypsipetes sordidata*, but

further instances would be interesting.—J. E. R. ALLEN, Enniskillen. *October 25th*, 1905.

EUVANESSA ANTIOPA AT FOLKESTONE.—Concerning the note of *Euvanessa antiopa* being seen at Folkestone on September 8th (*anteà*, p. 278), might this not have been an escape? Whilst staying at Dover during August, I noticed in a shop window a row of *E. antiopa*, stating "bred this season, 4d. each." It would be interesting to know if this was the case.—C. P. PICKETT, F.E.S. *October 27th*, 1905.

ABRAXAS GROSSULARIATA LARVÆ PUPATING IN OCTOBER.—Whilst at Loughton on October 21st, I noticed a currant bush almost stripped by larvæ of *Abraxas grossulariata*, of all sizes. On closer examination I discovered two pupæ and two fullfed larvæ (one of which is now changing to a pupa). There were many other larvæ about half-grown. This struck me as being very late for even a second brood, in nature, and is all the more remarkable as the weather has been so cold during October.—IBID.

CIDARIA PICATA DOUBLE-BROODED.—Having read the Rev. G. H. Raynor's note of breeding *C. picata*, I have to record that my experience with this species has been the same as his. About July 20th, this year, I obtained some ova at Starcross, which duly hatched, and the larvæ pupated during the latter part of August. Although kept in out-of-door temperature, the imagines began to emerge from the end of September to October 3rd, a few lying over. This is not the first instance of a second brood of this species appearing from ova obtained in July, as it happened to my friend, the late Mr. Tugwell, to whom I sent young larvæ some years ago. In addition to the above I have also bred, during the early part of September, a series of *Melanippe unangulata*, and a few *M. rivata* from July ova.—J. JÄGER, 65, St. Quintin's Avenue, North Kensington, W. *October 28th*, 1905.

AFTER CIRRHŒDIA XERAMPELINA.—In the year 1901 I was a little surprised when I took, at sugar in my garden here, five rather wasted specimens of this insect between September 5th and 11th. I saw no more until 1904, when careful work, in a clump of ash-trees on the marshes, produced nine specimens between September 7th and 17th. I found none this year. The preference of the species for damp situations has, I believe, been proved, yet I have a note of the capture of a specimen at Wanstead on September 11th, 1871. Sugaring for *C. xerampelina* always reminds me of a story which was told me by letter, some time in the "Eighties," by Dr. W. R. Buckell, then of Romsey, who has kindly given me permission to write it down. He had been taking the insect, and I had doubtless been begging specimens of him. And this is the tale which he told:—It was about the year 1885, in late August or the beginning of September, that he began to try the attractions of sugar in some low-lying meadows about a mile out of the town, and from whence the light of his lantern would be plainly visible. The first night he took a specimen of *Catocala promissa*, with commoner insects. Pleased with his capture, he went again night after night, sugaring in the same place. The last visit was paid upon an evening, when there was a heavy ground fog, which in itself might have warned him off. However, he hoped that the mist would pass off, and spread the sugar. After he had been at work some little while, he heard men's voices close at hand, and not knowing whether they might be poachers, or, indeed, what they might be up to, he felt a

bit nervous, shut up his lamp, and listened. Sugaring alone, in out-of-the-way places, is always eerie work. Well, nothing happened until, reflecting that he was doing no wrong, he turned on the lantern and started off once more to examine the patches. But no sooner did he show the light than there was a tremendous scuffling of feet and cries of "There 'e is!" "There 'e goes again!" Then he closed his lamp, and a voice exclaimed "'e's gone!" Not liking the aspect of affairs, he stood still behind a tree for a few minutes, and then—made his way home quietly, without a light. Next morning he was met by the groom with "Well, Master Will, you was very nigh getting shot last night. A lot of them has been across the Squab Meadows to shoot the Will-o'-the-wisp, but, when they got there, they remembered they had not got a 'crooked sixpence' to shoot him with. So they watched you while they sent into the town for one!" Thus it appears that Mr. Buckell owed his life possibly to the survival of an ancient superstition into the nineteenth century. So ran the story, and many a time when out alone on lonely places have I remembered it, shut up my lamp, and gone home without a light.—(Rev.) C. R. N. Burrows. Mucking Vicarage, Stanford-le-Hope, Essex. *November 9th*, 1905.

Polygonia c-album in Epping Forest.—I have a note in my diary to the effect that I took a specimen of this butterfly at Wanstead, on October 18th, 1871. I have a very cloudy recollection of the event, just sufficient to assure me that the entry is, so far as the species is concerned, correct. I have also an indistinct idea that I remember several captures of this insect in Epping Forest about the same time, and fancy that I have been told of this somewhat curious occurrence by old collectors. However, I can find no printed record. My series of the *Entomologist* goes back to 1873. It would, perhaps, be well to save the record from oblivion, if it is, as I suppose, not in print.—Ibid.

VARIATION.

New forms of Rumia luteolata.—I have taken one, and have seen several other specimens of a new form of *R. luteolata*. In it, the normal yellow of the wings is replaced by pure white, and the usual white scales of the discal scar show up like dashes of silver. This capture was made during the first week in June, 1905. For this insect the name ab. *lacticolor* is suggested. Since making the above note I have made enquiries, and I find that intermediate forms of a very pale primrose colour occur near Birtley, some five miles west of the locality in which the above occur. The name ab. *intermedia* will suffice to describe these.—J. W. H. Harrison, B.Sc., The Avenue, Birtley R.S.O., Durham. *October 2nd*, 1905.

Aberrations of Cœnonympha pamphilus, Linn., at Wimbledon Common.—(1) A ♂ specimen of *C. pamphilus*, having a distinct row of six ocellated spots parallel to the margin on the underside of each hindwing, thus, in this respect, agreeing with ab. *ocellata*, Tutt. The upperside is of the usual bright tawny colour, the apical spot on the forewings being large and dark. On the hindwings the three lowest ocellated spots are replaced by blackish-brown spots (not ocellated) on the uppersides, the centre one of these three being very distinct, the top *one fairly* so, while the bottom one is almost indistinguishable from

the marginal band. (2) An extremely pale yellowish-tawny ♀ specimen, with greyish marginal bands, the apical spot being fairly large and of a greyish colour. The dark markings on the underside is distinctly greyer than in normal specimens. I take this to be ab. *pallida*, Tutt. Both were taken on Wimbledon Common in August, 1905.—RALEIGH S. SMALLMAN, Wressil Lodge, Wimbledon Common. *October 29th*, 1905.

VARIATION IN LARVÆ OF PAPILIO MACHAON.—The larvæ of *Papilio machaon* have been plentiful until quite recently, feeding chiefly on fennel. I have only found one or two myself, but a friend, who has more spare time than I have, collected about thirty. One was brought to me a week ago that had been found feeding on rue. Its ground colour is very much brighter green than is usual with larvæ here, although there is always a trace of green about them. In Corsica, this summer, the larvæ of *P. machaon* had their ground colour pure white.—H. POWELL, 7, Rue Mireille, Hyères. *November 2nd*, 1905.

NOTES ON LIFE-HISTORIES, LARVÆ, &c.

LARVÆ OF OPORABIA AUTUMNATA.—Until lately I have thought that any *Oporabia* larva with red or black markings must be *dilutata*. Last April, however, a larva in one of my broods of *O. autumnata* developed some black markings. On April 29th, I wrote the following description—"Black dorsal line on segments 4-10; black transverse line at divisions of 5-10." I kept the larva by itself, thinking it might possibly be a *dilutata*, included by accident among the *autumnata*. Today the moth has emerged, a deformed, but unmistakable, *autumnata*. Among many hundreds of larvæ of *O. autumnata* which I have had in my possession during the last few seasons, this is the only one in which I have observed any trace of black markings.—J. E. R. Allen, Enniskillen. *October 25th*, 1905.

SOCIETIES.

SOUTH LONDON ENTOMOLOGICAL SOCIETY.—*October 26th*, 1905.—A BROWN ABERRATION OF PSEUDOTERPNA PRUINATA.—The Rev. E. Tarbat exhibited a specimen of *P. pruinata* in bred condition from Morthoe, in which the usual green colour was replaced by a rich yellowish-brown. HEMIPTERA FROM BOX HILL.—Mr. W. West, of Greenwich, exhibited *Drymus sylvestris* var. *ryei* found under dead leaves, *D. pilicornis* and *Berytus crassipes*, found under stones on Box Hill. *November 9th*, 1905.—BRED ACIDALIA AVERSATA.—Messrs. A. Harrison and Main exhibited a short series of *A. aversata*, bred from ova laid by a ♀ taken at Bude. Six were reddish and banded like the ♀ parent, five were ordinary putty-coloured, four were without a band, one possessed a very dark band. AUTUMNAL PARARGE EGERIA.—Mr. R. Adkin exhibited specimens of *P. egeria* from Shaldon, taken September 21st, 1905, one of which was extremely dark compared with others taken at the same time. BRED POLYOMMATUS BELLARGUS.—Mr. Rayward exhibited a series of bred *Polyommatus bellargus* from Reigate. VARIATION OF MARKINGS ON PUPA OF PIERIS NAPI.—Mr. Main exhibited pupæ of *Pieris napi*, showing great variation in the number and intensity of the black markings.

ENTOMOLOGICAL SOCIETY OF LONDON.—*November 1st*, 1905.—PAN-

URGUS MORICEI, Freise.—A BEE NEW TO SCIENCE.—The Rev. F. D. Morice exhibited *Panurgus moricei*, taken by himself near Gibraltar, remarkable in the fact that whereas species of this genus are entirely black, in this species the ♂ face is entirely, and the ♀ partly, bright yellow. The legs are partly yellow, and the abdomen spotted down each side, very much as in *Anthidium*. UNIQUE SPECIMEN OF HERIADES FASCIATUS, Freise.—Mr. Morice also exhibited the unique type specimen of *Heriades fasciatus*, of the *Chelostoma* group—a ♀ taken by himself at Jericho in 1899. Its congeners are practically unicolorous, but in this species the abdomen is brightly banded, as in a wasp. The exhibitor pointed out that the colour mimicry in this species could not be due to parasitism, both *Panurgus* and *Heriades* being industrious genera. FORFICULA AURICULARIA WITH ABNORMAL CERCI.—Mr. W. J. Lucas called attention to a ♂ specimen of *Forficula auricularia* taken at Warwick in September last, and showed a drawing of the cerci (forceps) which were very abnormal, the broader basal part of the two appearing to be more or less fused together, while the legs of the forceps were jointed to the basal part. COLEOPTERA NEW TO THE BRITISH ISLES.—Mr. Norman H. Joy exhibited two species, *Laemophloeus monilis*, F., taken in the neighbourhood of Streatley, Berks, and *Dacne fowleri*, n. sp., from Bradfield, with specimens of *D. humeralis* and *D. rufifrons* for comparison. A NEW BRITISH AGATHIDIUM.—Mr. H. St. J. Donisthorpe showed a specimen of a new British *Agathidium* (*badium*, Er.), discovered last year in Cumberland, and since taken by himself in Durham. PRIONOCYPHON SERRICORNIS WITH AQUATIC LARVA.—Mr. Donisthorpe exhibited a series of this insect, the larva of which he said lived under water in the boles of trees, but appeared to leave the water for the purpose of pupation in the ground. SCENTS OF BUTTERFLIES.—Dr. F. A. Dixey exhibited preparations of the scents of some African butterflies, collected by himself with the assistance of Dr. G. B. Longstaff, during the recent visit of the British Association to South Africa, with specimens of the species investigated. *November 15th*, 1905. CROSS-FERTILISATION OF ASCLEPIAS.—Mr. Arrow showed a flower-frequenting beetle from the Transvaal, illustrating the cross-fertilisation of flowers, one of the front feet being tightly clasped by curiously formed pollinia of an *Asclepias*. ABERRATION OF AGROTIS TRITICI. Mr. W. J. Kaye exhibited a specimen of *Agrotis tritici*, bearing a close resemblance to *A. agathina*, in company with which it was taken, while flying over heather at Oxshott. ABERRATION OF FORFICULA AURICULARIA.—Mr. W. J. Lucas exhibited a specimen taken at Deal in September, by Mr. R. A. R. Priske, in which the left cercus is normal, the right that of var. *forcipata*. TORTRIX PRONUBANA, Hubn.—Mr. Selwyn Image exhibited a male specimen of this insect, which is new to the British List. It was taken by Mr. Harold Cooper at Eastbourne, either at the end of September or beginning of October last. The species was first taken in the Channel Isles, in 1898, by the Rev. F. E. Lowe, and a lengthy article on the species, written by this gentleman, is published in the *Ent. Record*, xii., pp. 316-317.—ED.

CITY OF LONDON ENTOMOLOGICAL SOCIETY.—*November 7th*, 1905.—HEREDITY EXPERIMENTS ON TRIPHÆNA COMES.—Mr. A. Bacot brought his extensive series of this species, illustrating his experiments in heredity. The original parents were selected from specimens bred

from larvæ from Aberdeen. In the first generation a melanic male and a bright red female produced 60% red, and with 40% melanic forms. In the second generation red imagines produced 100% red progeny, while melanic imagines produced 70% to 80% melanic with the remainder red. In the third generation, broods from melanic and non-melanic parents bred absolutely true. ABERRATIONS OF ANGERONA PRUNARIA.—Mr. C. P. Pickett showed a bred series, including two females bred from Monmouth, a female from Raindean, and a male from Essex, with the usual chocolate bands, dull smoky-brown, the yellow ground colour being also very dull. SCENT-FANS OF APOROPHYLA NIGRA.—Mr. G. H. Heath exhibited a male in which the white scent-fans were extruded from their cavities in the sides of the abdomen. MALFORMED CIDARIA TESTATA.—Mr. H. M. Edelsten, a specimen with both hindwings absent. It was taken flying to light in the Norfolk Broads. NOMIADES SEMIARGUS (ACIS) AND CYCLOPIDES PALÆMON REPORTED FROM MICKLEHAM.—Mr. W. Beattie showed a ♂ and a ♀ of the first, and a single specimen of the second, species, captured by himself or by his daughter during 1903 or 1904. Unfortunately the exhibitor could give no more precise data*. OPORABIA DILUTATA VAR. CHRISTYI.—Mr. E. A. Cockayne showed a specimen bred from a larva beaten from elm at Rannoch. *November 21st*, 1905.—HEREDITY EXPERIMENTS WITH HEMEROPHILA ABRUPTARIA.—Mr. E. Harris showed a long series of bred specimens representing four generations. The original parents were a typical male and a melanic female from north London. The first generation yielded 50% melanic and 50% non-melanic forms. Two dark specimens of this brood produced 70% melanic and 30% non-melanic. From these again four pairings were obtained—A. Both parents melanic gave wholly melanic progeny. B. Light parents gave light progeny. C. Melanic male and light female gave 80% melanic. D. Light male and dark female gave 68% dark and 32% light. ASYMMETRICALLY MARKED ANGERONA PRUNARIA.—Mr. C. P. Pickett showed a male specimen of this species, bred in July, 1905, in which the right wings were ab. *sordiata* while the left were ab. *pickettaria*. PHARETRA RUMICIS AB. SALICIS.—The Rev. C. R. N. Burrows showed six specimens of this aberration bred by Newman from Barnsley. EUPITHECIA SUBCILIATA AT TORQUAY.—Mr. V. E. Shaw, exhibited a series taken at Torquay on July 27th, 1905. OVA OF THECLA PRUNI.—The Rev. G. H. Raynor brought up a few ova which had been laid by females bagged upon the foodplant (blackthorn). The eggs are laid upon the stems and are very difficult to discern. ABRAXAS GROSSULARIATA ABERRATIONS.—Mr. J. Riches exhibited interesting forms bred amongst many others. The most noteworthy being an asymmetrical specimen, with a large black blotch upon the right forewing which was not reproduced upon the left.

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—*November 20th*, 1905.—PHOTO-MICROGRAPHS OF COLEOPTERA, DIPTERA, AND HEMIPTERA.—Mr. O. Whitaker exhibited, by means of the lantern, the antennæ of *Hydrophilus piceus*. *Acilius sulcatus*, and *Melolontha vulgaris*: maxillary palpi of *Acilius sulcatus*, and *Creophilus maxillosus*; antennæ, tongue,

* It is unfortunate that more precise data cannot be given of so important a species in our fauna. The capture of *C. palaemon* at Mickleham is almost (or quite) as remarkable. Surely some mistake has occurred ?—ED.

tarsus of front leg of *Eristalis venax*; series of slides of *Corixa geoffroyi*, including ♂ front legs, showing stridulatory organ, front, middle and hindleg of ♀, elytron of mature and immature specimens, etc.; foreleg of *C. praeusta*; elytra of *C. sahlbergi* and *Notonecta glauca*, etc. PHOTO-MICROGRAPHS OF LEPIDOPTERA.—Mr. O. Harrison, a series of slides including eggs of *Hemerophila abruptaria*; larva of *Manduca atropos* on potato; larvæ of *Cucullia lychnitis* on black mullein; larva of *Cerura vinula* resting before moulting; ova of *Macrothylacia rubi* on *Myrica gale*; winter and summer forms of the pupa of *Leptidia sinapis*; ova of *Melitaea aurinia* on scabious, etc. IMAGINES OF LIMNOPHILA ELEGANS.—Specimens of this rare species were exhibited by Dr. Cassal, captured at Ballaugh, Isle of Man. COLEOPTERA EXHIBITED.—*Pterostichus parumpunctatus* from Gibside (Bagnall); *Thanasimus formicarius* from Monkswood (Tait). APTYERYGIDA MEDIA FROM KENT.—Mr. Sopp exhibited specimens of this insect from Huntingfield taken by Mr. Chitty.

CURRENT NOTES.

It is with the greatest pleasure that we learn that Professor T. Hudson Beare has been elected President of the Royal Scottish Society of Arts for 1905-6.

Part II of *A Natural History of the British Butterflies, their world-wide Variation and Geographical distribution*, was published on November 15th. This part contains, in the section on the general subject, the conclusion of the chapter on "Egglaying of Butterflies," a chapter on "Eggs of Butterflies," and a part of a chapter on "Photographing Butterfly Eggs." In the systematic section, *Adopaea flava* is treated in detail under the heads of "Synonymy," "Original Description," "Imago," "Sexual Dimorphism," "Gynandromorphism," "Variation" (with descriptions of nine new aberrations and varieties), "Egglaying," "Ovum," "Habits of Larva," "Larva," "Variation of Larva," "Foodplants," "Puparium," "Pupa," "Time of Appearance" (with exact dates in all parts of Britain for 25 years), "Habitat," "Habits," "British Localities" (arranged by counties, and with the name of the entomologist responsible), "Distribution" (in similar detail). This is followed by a study of the "Genus *Thymelicus*," and its "Synonymy," and a full account of *Thymelicus acteon* under the heading of "Synonymy," "Original Description," "Imago," "Sexual Dimorphism," "Gynandromorphism," "Variation" (with descriptions of five new aberrations), "Egglaying," "Ovum," "Habits of Larva," "Larva," "Foodplants," "Puparium," and "Pupa"; the remainder of this species will be published in Part III, with the next species on the list, on December 15th. The plate in Part II is the "Apparatus for Photographing Eggs," that in Part III will contain the remainder of the "Skipper" eggs and the Chrysophanids (two forms of *C. phlaeas*), and those of other allied species for comparison. We are publishing a copy of the plate given with Part III with this number of the *Ent. Record*, so that those who have not yet seen either of the published parts can get some idea of the quality of the illustrations.

We have noted above the capture of *Tortrix pronubana* at Eastbourne by Mr. Harold Cooper, in late September or early October this year. Mr. W. H. B. Fletcher also captured a specimen about 10 a.m., on October 23rd, 1905, in his garden at Bognor. Superficially, with its

mahogany-tinted forewings and yellow hindwings with a black margin of true underwing type, it has all the general appearance of a tiny "yellow underwing." It is double-brooded in the south of France. We noted it as abundant, flying in the morning sunshine, by a hedgeside near La Valette, on April 30th, 1905 (see *anteà*, p. 217). We have already referred to the Rev. F. E. Lowe's article (*anteà*, xii., pp. 316-317) on the species.

Dr. Sharp describes (i) *Tetropium crawshayi*, a beetle new to science. It occurs in this country, in the district lying between Norfolk (*teste* Atmore) and the New Forest (Sharp). (2) *Tetropium parcum*, also new to science, known only from two examples in the museum at Cambridge, and labelled "near Manchester, 1864." He also believes that *T. gabrieli*, Weise, is the species recorded by Bouskell and Donisthorpe as *T. castaneum*.

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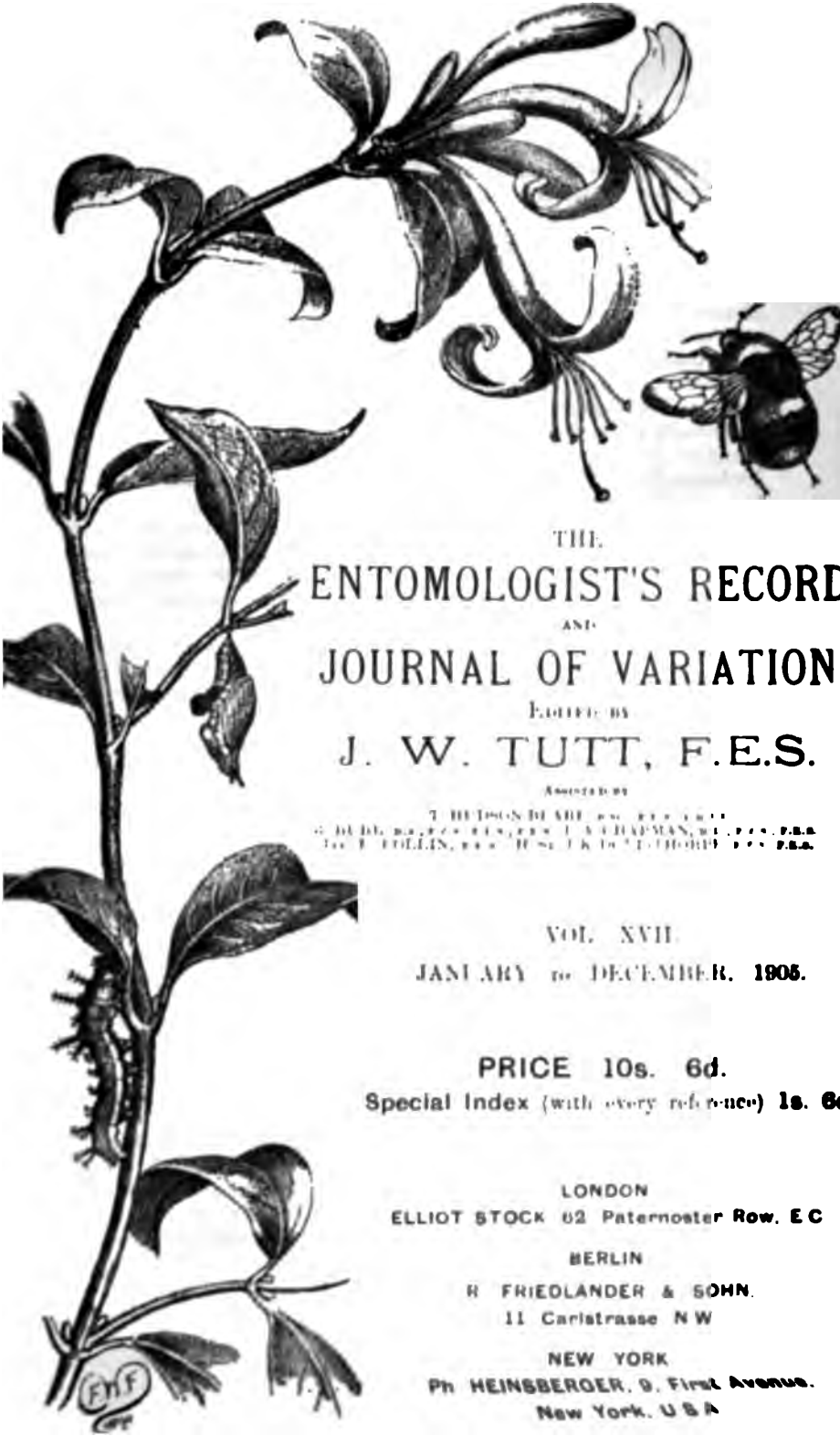

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AND

JOURNAL OF VARIATION

EDITED BY

J. W. TUTT, F.E.S.

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PREFACE.

On the completion of Volume XVII, we have again to thank our large circle of subscribers and contributors for their kind and generous help. We have always been more than provided with interesting and useful material for publication, and our illustrations have increased beyond those of any previous year. For help in this latter direction we are particularly indebted to the generosity of Dr. T. A. Chapman, Messrs. M. Burr and W. G. Sheldon.

For their editorial duties in connection with the section relating to "Coleoptera" we thank most heartily Mr. Donisthorpe and Professor T. Hudson Beare. As this branch is placed entirely in their hands, the success of it is entirely due to them. Amongst others whose help is specially to be mentioned are the Rev. C. R. N. Burrows, who has compiled our General Index, and Messrs. M. Burr, H. J. Turner, and Professor T. H. Beare, who have practically completed the "Special Index," which should appear with the January number.

It has long been a matter of doubt whether or not we should publish the Reports of Societies. Our reasons for excluding them were twofold: (1) The small scientific value of many of the records, thus occupying room that can ill be spared. (2) The uselessness of repeating what is already printed elsewhere (sometimes five or six times over). The reasons for including them are less clear. We are informed that many lepidopterists only see the *Ent. Record* of the entomological magazines (which is unfortunate and, in our opinion, to be regretted), and yet wish to know what is going on at the societies; also that exhibitors like to see their exhibits noted in the magazine. These may be cogent reasons for including reports that oust original scientific observations and articles, but we confess to a doubt in the matter. At any rate, as these are evidently the views of a section of those who were amongst the earliest and are still the most strenuous supporters of the magazine, we have been constrained to go back on our practice of the last eight years. Our friend the Rev. C. R. N. Burrows has promised to make the most he can of the reports, which should be sent direct to him.

There has recently been quite a large increase in the quantity of notes on British insects submitted for publication, which have temporarily ousted longer faunal papers on extra-British species. These latter of course will be printed in turn, but, if this continues, writers of long papers will have to resort to judicious condensation to give their papers a chance against the numerous short notes of more general interest to British collectors. We suspect, however, that the matter is quite temporary, and simply state the fact in apology to those whose articles have not yet been printed, but which will be put in hand at the first opportunity.

There seems to be no need to propose any alteration in the style or arrangement of the magazine, although we are always glad to receive hints that may tend to make it more successful, and will give fair consideration thereto.

ERRATUM (to be bound facing page 277).

Owing to an accident some of the folios of the article, pp. 277-279, have been misplaced. This has entirely altered the sense and meaning of what was written, and has carried over to *Papilio asterias* and *P. philenor* remarks made about *P. machaon*. At the bottom of p. 277 (following "the older wood"), and throughout p. 278, the paragraphs should read as follows :—

Amongst the young stems of *Lonicera* I found 20, the 14 green amongst the leaves or upon the young wood, with two exceptions, whilst the six blacks were all upon the lower stems of old wood. In addition to them I found a few pupæ on London Pride, perennial phloxes, etc. Twenty-four larvæ, which I removed indoors and fed upon *Skimmia* in a large breeding-cage of perforated zinc and wood, all changed to pupæ of the brown variety. These results only confirm my observations of previous years, and it appears to me that the presence of the more common green variety is almost always coincident with pupation amongst green leaves. I think it is certain that it is not due to exposure to more light, for all the pupæ which I found in the full sunlight on the white wood of the butterfly-house (some of these were even on the top) were of the brown kind. To turn to another matter, *viz.*, the wish to find out, if possible, when the colour of the pupa is determined.

I removed, on August 6th, five larvæ which had already spun up for pupation upon the lowest black stems, and pinned them up with as little of their former surroundings as possible amongst the topmost green shoots; all five, however, changed into brown pupæ. At the same time I removed seven of the larvæ spun up amongst the green shoots, and pinned them to the black stems at the bottom of the shrubs, taking care either to remove the larvæ altogether from the brown stems to which they were attached, or to change the colour of the latter by smearing them with soot, etc. All these, however, remained green, as did two on stems which I placed indoors in a dark box. These larvæ were removed from their natural surroundings from two to five days before pupation, indeed, as soon as they were securely fixed up, a fact which, I think, proves that whatever determines the colour of the resultant pupa is an affair of some time previous to the change itself. The above observations, in addition to similar ones of previous years, incline me to think that the colour dimorphism of *P. machaon* is specially of a mechanical nature, though, of course, the results are not conclusive.

With a view to obtaining confirmatory evidence of my results with *P. machaon*, I bred this summer some 40 specimens each of *Papilio asterias* and *P. philenor*, two North American species with dimorphic pupæ. *P. asterias*, as I daresay most readers of this article know, is a near relation of *P. machaon*, the ovum and larva are very similar, though the female imago resembles *P. troilus* more closely. *P. philenor* is a subtropical butterfly, and more nearly allied to the Ornithoptera. My results with these were, however, less conclusive. I found both the green and red-brown forms of the pupa of *P. philenor* upon the white wood of the bnttertly-house, though the pupæ on the young stems of *Lonicera* were of the green variety, and those on tree-stems, etc., away from green leaves were red-brown. With regard to *P. asterias* I found also that the pupæ found upon the wood of the butterfly-house were indifferently green or brown, those on its foodplant, fennel, were green.

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MEETINGS OF SOCIETIES.

Entomological Society of London. 11, Chandos Street, Cavendish Square, W., 8 p.m. Annual meeting January 17th, 1906.

The City of London Entomological and Natural History Society. London Institution, Finsbury Circus, E.C. The first and third Tuesdays in the month, at 7.30 p.m., except in July and August. December 19th, "The *Rheumaptera hastata* group," by L. B. Prout. January 2nd, Pocket Box Exhibition; January 16th, "Breeding British Tiger Moths."

Toynbee Hall Natural History Society.—Held at Toynbee Hall, Commercial Street, E., Mondays, at 8 p.m. January 8th, 1906, Presidential Address. Field Meetings: December 17th, Sevenoaks; London Bridge, 9.12 a.m. January 14th, Loughton; Liverpool Street, 9.45 a.m.

The South London Entomological and Natural History Society, Hibernia Chambers, London Bridge. The second and fourth Thursdays in each month, at 8 p.m. December 14th; January 11th, 25th (Annual Meeting **at 7 p.m.**).

North London Natural History Society, Hackney Technical Institute, adjoining Hackney Downs Stations, G.E.R., at 7.45 p.m. The 2nd and 4th Tuesdays in the month. December 19th.

Lancashire and Cheshire Entomological Society.—Hon. Sec., E. J. B. Sopp, 104, Liverpool Road, Birkdale. From whom all necessary information can be obtained.

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EXCHANGE BASKETS.—October 27th, 1904, No. 1 basket.—Messrs. Horne, Day, Studd, Robertson, Ovenden, Fox, Bowles, Bower, Mera, Riding, Day, Horne. December 10th, 1904, No. 2 basket.—Dr. Riding, Rev. C. D. Ash, Messrs. Whittle, Adkin, Ovenden, Studd, Robertson, Walker, Riding, Bower. [Members who wish to be missed must write to the name preceding their own on list, not to the Secretary.] The names of one or two new candidates for admission will be welcomed and room made as opportunity offers. **Some Members are not noting receipt of basket to Secretary on its Arrival to them.**

Duplicates.—Elpenor, Jacobeæ*, Margaritaria (fine), Multistrigaria, Amataria, Aurantiaria, Cæsiata, Nanata, Impluviata, Perla, Anceps, Australis, Vestigaealis, Hawarthii (very fair), Crocsago, Chi and var. Olivacea (2), Graminis, Pisi*, Solidaginis, Flavicincta, Populata, Plumbaria, Luteata, Lactearia, Heparata, Rivata, Atrata.—*W. G. Clutten, 132, Coal Clough Lane, Burnley.*

Duplicates.—Ova of Chi *var.* Olivacea and many pupæ of various species. *Desiderata.*—Pupæ of A. populi, M. tiliæ, Dromedarius and Cucullina, &c., also ova of many species.—*E. M. Harrison, Birtley, R.S.O., Durham.*

WANTED.—Ova; I wish to obtain photos of the ova of British lepidoptera. Will anyone having ova of any species, and willing to lend same, send me a list on postcard? I will undertake to return complete and undamaged as quickly as possible, and willingly pay postage.—*Alfred E. Tonge, "Aincroft," Reigate, Surrey.*

WANTED.—British and European Tortricids, especially those species credited to both Europe and America in Meyrick's *Handbook* and Staudinger and Rebel's *Catalog*, pinned and set in English style acceptable. Will make liberal returns in any family of North American Lepidoptera named or other orders unnamed.—*W. D. Kearfott, 114, Liberty Street, New York City, U.S.A.*

WANTED COLEOPHORIDS.—As I wish to breed and record the life-history of all the species of *Coleophora*, I should be pleased to receive any cases and living larvæ which entomologists may meet with. I will do what I can in return.—*Hy. J. Turner, 98, Drakefell Road, St. Catherine's Park, New Cross, S.E.*

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WANTED.—Erycinidæ of the world. Offer for same Diurni from United States.—*Levi W. Mengel, Boys' High School, Reading, Pa., U.S.A.*

WANTED.—Parasites from British Coleoptera. Beetles infested with *Gordius*. Any material will be gratefully acknowledged.—*H. St. J. K. Donisthorpe, 58, Kensington Mansions, S.W.*

PARASITICAL DIPTERA WANTED.—Will lepidopterists who may breed any dipterous parasites from larvæ or pupæ kindly forward such as they do not require to me? If so I shall be greatly obliged.—*C. J. Wainwright, 2, Handsworth Wood Road, Handsworth, Staffs.*

CHANGE OF ADDRESS.—*J. E. R. Allen*, from Colne to *17, Lansdowne Street, Manchester Road, Burnley.* (Irish address as before.)

MEETINGS OF SOCIETIES.

Entomological Society of London.—11, Chandos Street, Cavendish Square, W., 8 p.m. Meetings: January 18th, 1905, Annual Meeting.

The City of London Entomological and Natural History Society.—London Institution, Finsbury Circus, E.C.—The first and third Tuesdays in the month, at 7.30 p.m., except in July and August. January 17th, February 7th, February 14th.

Toynbee Hall Natural History Society.—Held at Toynbee Hall, Commercial Street, E., Mondays, at 8 p.m. Field Meetings: January 15th, Leatherhead; London Bridge, 10.5 a.m.

The South London Entomological and Natural History Society, Hibernia Chambers, London Bridge.—The second and fourth Thursdays in each month, at 8 p.m. January 26th, Annual Meeting (commences 7 p.m.). February 9th, February 23rd.

North London Natural History Society, Hackney Technical Institute, adjoining Hackney Downs Stations, G.E.R., at 7.45 p.m. The 2nd and 4th Tuesdays in the month.

Lancashire and Cheshire Entomological Society.—Hon. Sec., E. J. B. Sopp, 104, Liverpool Road, Birkdale. From whom all necessary information can be obtained.

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